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ABSTRACT

This publication contains speeches and discussions presented at the conference "Perceptual-Motor Development: Action with Interaction" held in Cincinnati, Ohio, October 1970. The conference, sponsored by the Physical Education Division of the American Association for Health, Physical Education, and Recreation, provided educators with the opportunity to examine major conceptual viewpoints of perceptual motor behavior, to review visual displays of many teaching methods for the benefit of perceptual motor performance, to hear research in progress that seeks new information needed to improve school programs, and to pinpoint conceptual issues in this field. Coordinating these objectives, the papers in this publication are divided into four sections: I--Foundations of Perceptual Motor Learning; II--Practices: Action and Interaction; III--The Quest for Understanding; and IV--Resource Materials. A list of the conference participants is appended. (BRB)

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FOREWORD

The material for *Foundations and Practices in Perceptual-Motor Learning—A Quest for Understanding* was obtained from speeches and discussions presented at a conference entitled "Perceptual-Motor Development: Action with Interaction" held in Cincinnati, Ohio, October, 1970. This conference was sponsored by the Physical Education Division of the American Association for Health, Physical Education, and Recreation.

The committee for the proceedings, with the advice and consent of the Perceptual-Motor Task Force, organized the material into a format which best represented the total picture of the conference. Preparing the material involved editing original papers that were presented as well as transcribing taped recordings. The editing and retyping were done for consistent reproduction. In some cases, material was reduced to obviate the need for duplication. Where major changes were made, the rough draft of the material was sent to the author for his comments. If no major changes were necessary, the committee printed the original paper, editing only those areas where it was necessary to have a consistent format.

In many instances it was impossible to capture the full flavor and excitement of the conference. For example, the action programs were best understood by actual viewing. However, many of the programs did lend themselves to written presentation; hopefully, through this written medium, new ideas and further understanding of ongoing programs will be generated.

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PREFACE

The potential performance success of a child encountering any domain of learning is predicated on his being perceptually "in tune" with at least some of the many relevant cues in his immediate environment. Perhaps as significant are the procedures he uses in processing the information these cues yield. Thus, perception and information processing have become the focal points of educational concern in every facet of the teaching-learning sphere.

After an analysis of the many issues surrounding the developing perceptual-motor programs mushrooming in elementary schools, the Physical Education Division of AAHPER, in 1967, appointed the Perceptual-Motor Task Force and charged this group with the responsibility of identifying the directions to be taken by the profession. The Task Force determined that priority should be given to providing the scientific foundations needed for guiding the logical development of school programs intended to enhance perceptual-motor development.

The philosophical emphasis of the Task Force continues to be focused on the developmental perspective of perceptual-motor behavior. Members of the Task Force perceive perceptual-motor development to be one of the most critical processes in human development, if not the most critical. Emphasis on this dimension in learning must be the concern of *every* physical educator. Interest and knowledge of perceptual-motor foundations should not be confined to those teachers interacting with children identified as having learning disabilities.

This conference, the second in a series of four, provided opportunities for educators with mutual interests, although from many educational fields, to examine major conceptual viewpoints of perceptual-motor behavior; to view live and visual displays of many teaching methods for the enhancement of perceptual-motor performance; to hear research-in-progress that seeks new information needed to improve school programs; and to pinpoint conceptual issues in this rapidly expanding domain of knowledge.

It was the intent of the Conference Planning Committee to develop a program which would blend foundations with practices. Many teachers already have learned that the perceptual-motor functioning of one's students cannot be improved merely by the application of a repertoire of techniques. Conversely, the thousands of children operating daily at an ineffective perceptual-motor level cannot wait for the slow process of theory verification. As development of new methods and programs continues, educators must seek current scientific information to use in validating their practices. Yes, the method 'works," but why? We must identify the *reason* it was successful, lest it may be labeled a chance success or one due to the charisma of a particular teacher.

With this perspective in mind, the reader will find the papers in this publication divided into four sections: I Foundations of Perceptual Motor Learning; II Practices: Action and Interaction; III The Quest for Understanding; and IV Resource Materials.

PART I

FOUNDATIONS OF PERCEPTUAL-MOTOR LEARNING

> *. . . no more than you can "unhook" the mover attachment can you "unhook" physical education from the multi-discipline approach.*
>
> **SHELDON RAPPAPORT**
> **Cincinnati, 1970**

PERSPECTIVES 1970

Hope M. Smith
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Introduction

My mission is to delineate perspectives in relation to perceptual-motor behavior, perceptual-motor theories, and the practical aspects of perceptual-motor educational programs currently in progress.

One cannot really make sensible projections for the future unless he knows where he is and how he arrived at his present location. Therefore, this presentation will consist of a brief chronicle of past events leading to our present condition; an outline of critical problems that need immediate solution before future perspectives become clear; and optimistic predictions about what may lie just beyond the horizon.

Historical Background

A persistent issue in perceptual theory traceable to late 17th century and early 18th century philosophy and psychology is that of empiricism versus nativism (later referred to as environment versus heredity). Fortunately, the heat of this argument has dissipated and only a few people persist in supporting one or the other viewpoint exclusively. A parallel of this argument in physical education is illustrated by the two cliches, "he's a born athlete" and "athletes are not born, they're made." Fortunately, there are few who would deny that one's inherited structural, neurological, and physiological equipment determines potentials, but experiential and environmental factors dictate whether or not those potentials may be achieved.

A second issue that has plagued both psychologists and physical educators is the question of the specificity or generality of the transfer of training. Evidence weighs heavily in favor of the specificity advocates insofar as perceptual-motor task performance is concerned; the generalists have presented a very tenuous case.

The third issue lies in the area of development. In the 19th century, perceptual theorists argued over whether certain perceptual phenomena, such as visual depth perception and size constancy estimations, resulted from experience and learning or whether these were functions of the visual process from birth. Since most experimentation and demonstration involved the study of adults, the resulting observations on development were speculations rather than scientific data. During the past 30 years, increasing interest in human development has produced better observations, data from longitudinal studies, controlled experiments with very young children, and a general unwillingness to treat perceptual development and motor development as mutually exclusive processes. Former compulsions to study children under one year old as mindless bodies and children over one year old as bodiless minds are fast disappearing. It would be difficult indeed to read D.O. Hebb's brilliant analysis of early learning in humans or Piaget's observations and description of the sensory-motor stage of development and continue to ignore the importance of motor activity during early developmental stages. Both of these analyses were written over 20 years ago, but it wasn't until the late 1950s that several workers, in seemingly unrelated disciplines, began to communicate their theories concerning the relationship between prescribed motor activities and improvement of perceptual functions. Most of these professionals became interested in motor activity programs because of their work with children who were classified as mentally retarded, brain damaged, perceptually handicapped, slow learners, or youngsters with severe learning disabilities, particularly those having difficulties in achieving adequate reading levels.

Thus, the beginnings of these motor programs were therapeutic in nature rather than preventive, and by the early 1960s, programs of this type began to appear in public schools as well as private institutes and clinics. In many instances, physical education specialists working in elementary schools were asked by their school administrators to design and supervise motor activity programs for children who had been classified as "perceptually handicapped" or as having learning disabilities. Since little controlled research had been done to substantiate the effects of various motor program activities, physical educators were forced to develop motor programs of an eclectic nature, employing combinations of activities suggested by a variety of sources. As a consequence, physical educators found themselves serving in capacities for which they were not prepared, attempting to achieve objectives that were not clearly defined. Furthermore, they were conducting programs aimed at therapy; this was different from the prevention programs to which they were accustomed.

Frustrated by a lack of clear objectives and by inadequate tests for measuring status and progress, many physical education teachers sent requests for help and information to the AAHPER offices in Washington, D.C. The responsibility for answering these requests fell to the consultant for elementary school physical education, Margie Hanson, who spent many days observing programs in action throughout the country and conferring with clinical and educational psychologists, optometrists, general classroom teachers, administrators, physical educators in the public schools, and physical education researchers in colleges and universities who were investigating problems in the area of perceptual-motor behavior. Her findings highlight the growing interest among physical educators throughout the country, as well as point to the increasing magnitude of the problems arising from the lack of scientific information available to those on the firing line.

In 1967, AAHPER appointed the Perceptual-Motor Task Force, with Marguerite Clifton of Purdue University as chairman. In 1968, the first project of this Task Force was accomplished: a Perceptual-Motor Symposium, held in Washington, D.C. This was a small, invitational conference, multidisciplinary in structure. The project was sponsored by the Physical Education Division of AAHPER. Proceedings of the Symposium and questions raised at the conference lead to several Task Force projects, one of which is this meeting.

Predictions

Despite the questions and problems that remain to be answered, our future looks bright. Though I risk becoming the Criswell of physical education, I predict:

1. Considerable changes, for the better, in physical education major curricula in most institutions of higher learning.
2. Outstanding changes in physical education programs in elementary schools – K through 5.
3. Employment of specialists for perceptual-motor training in preschool programs (child day care centers and other preschool programs). (Head start programs should have at least one specialist serving each program.)
4. More innovative ways of arranging the physical environment so that individualized learning experiences can take place.
5. Increased emphasis on using developmental stages of human behavior as guidelines for programming, rather than chronological age or grade groupings.
6. Batteries of valid and reliable assessment instruments that will aid in evaluating stages of development, both perceptual and movement.
7. A well functioning team approach to preschool and elementary education, rather than the "isolated specialist" approach we now take.
8. Computer aided diagnosis of learning problems and prescription of learning experiences.
9. Acceptance of movement education as an integral part of the pre- and elementary school curriculum because it is important in and of itself, not because it may enhance academic performance in other areas of the school curriculum.

There are more predictions I could venture; however, we must settle some questions I have proposed, because our answers to those questions will determine whether or not the predictions will come true.

A Basic Assumption

Let us assume that those of us at this conference subscribe to the continuation of perceptual-motor programs under the direct supervision of physical educators who work either in teams or as individuals. With this assumption underlying our deliberations, we must then ask of ourselves certain important questions.

Questions for Discussion

1. What kind of preparation does the physical educator need to make effective contributions to perceptual-motor programs?

2. What general knowledge should those *now* working in perceptual-motor programs have?

3. Should movement education for all children K through 3 be revised?

4. Should perceptual-motor programs be introduced along with *regular* physical education programs, or are the two programs mutually exclusive?

5. How do we analyze *critically* the mass of information now coming to us in books, pamphlets, monographs, materials listings, films, tape recordings and records, research reports, and journal articles?

6. Should we question the validity of the claims made for the efficacy, in improving perceptual-motor performance, of both commercial and noncommercial pieces of equipment?

7. How valid and reliable are the tests we are using to measure status and gains in performance?

EDUCATION OR IMPRISONMENT

Sheldon R. Rappaport
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Whether we like to think of it this way or not, when a child is born he automatically is sentenced to 12 years of school – be the experience good, bad, or indifferent, be it helpful or harmful. What kind of experience have *we* had in school? To what kind of experience are we sentencing this generation and future generations? Most of us have had very few really inspirationally gifted teachers during the course of our 12 years of school. Most of us have not had the luxury of teachers whose intuitive know-how inspired us and enabled our learning systems to function close to optimum.

For the most part, we had teachers who taught the curriculum and did what they were told by the school board, superintendent, and principal. As a result, most of our teachers were stultified. Nevertheless, we made out pretty well, at least those of us who were not victims of a completely inefficient learning system. But those who had more problems with the system didn't succeed as easily.

Current statistics indicate that 20 percent of the youngsters in our schools can't succeed by conventional teaching approaches. This means that we must take a careful, hard, and realistic look at education.

We learn best what we are exposed to longest. We are most comfortable and efficient in what we have done the longest. The nature of the learning system is such that we don't like change because it requires too much expenditure of energy. It's much easier to do what we have been doing for a long time.

Let's apply these principles to teacher-training. We learn most about teaching from our experience with being taught during our 12-year commitment in school. For the most part, we were taught in an educational system that said the teacher is the fount of all wisdom and that the teacher's job is to impart that wisdom to each child in her class. The system said that the means by which this information could best be imparted was for the children to sit at military attention with hands tightly clasped. The system said that children learn best when they are silent. The system said that periodically it was the teacher's duty to have the information that was put into the children's ear spewed back via a pencil put on paper. That educational system allowed little opportunity for optimal use of the learning system or for the integration of information for usable purposes. This is the basic training of teachers because this is what teachers have had the most experience with.

To know how the educational system should be changed, we should examine the purpose of learning. What is learning all about? Why did nature provide a system that enables us to learn? Only very recently have we had an opportunity to look carefully at the system by which learning takes place. Only recently have we discovered that it is a series of complexities, rather than a simple stimulus-response unit. I often think that in the days when that formula was in our textbooks, the reason for the gap between the s and the r was because no one knew what went in between. We are now just beginning to discover the whole myriad of biochemical and experiential complexities that go in between. There are many aspects of learning we still don't understand, but we know enough to provide a different and better learning climate for children than that to which we were exposed.

One of the basic purposes of the learning system is to enable us to cope with the increasing demands of the environment. At conception, we are genetically coded for that opportunity. It is very interesting that one of the first aspects of the learning system that gets turned on is movement. But somehow in the educational system, by the time a child is six, he is not supposed to move anymore in order to learn. If moving is so important for learning to deal with the new, extrauterine environment, why doesn't traditional education allow the child to move in order to learn?

During the course of development, we are expected to adapt to increasingly complex demands from a great number of people in more and more complex situations. We spend most of our life doing this, at least until retirement age.

The first task of the learning system is to confront us with the demands of the environment. We can't learn how to cope with the environment unless we know what it demands of us. The conceptual model of the learning system to be discussed was published in *Public Education for Children with Brain Dysfunction* by Syracuse University Press in 1969. The conceptual model indicates that we have information processing modes designed to put us in contact with what the world demands of us, whether we have newly emerged into the extrauterine world or the school world.

not only the verbal but also the nonverbal—gestures, facial expressions, body movement, tone of voice—are represented here by "saying."

Although teachers are not specifically trained to do so in college, they can learn to become good observers, thereby getting a good assessment of how intact the various information processing modes are. They can also learn the developmental sequence or emergence of the information processing modes.

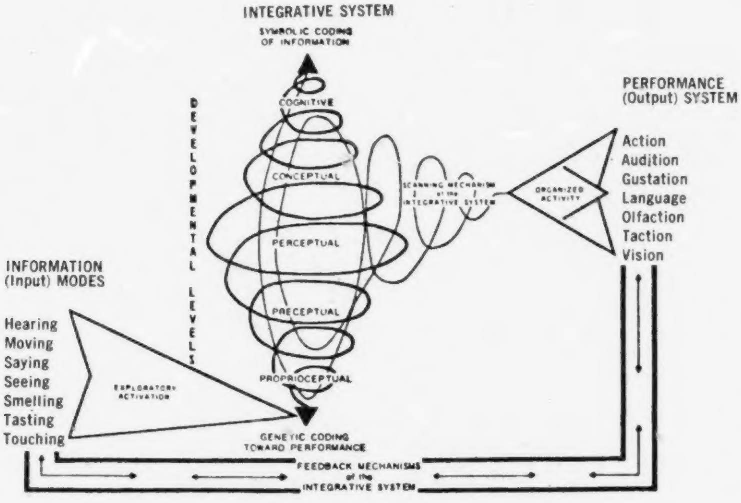
INTEGRATIVE SYSTEM
SYMBOLIC CODING OF INFORMATION
COGNITIVE
CONCEPTUAL
PERCEPTUAL
PRECEPTUAL
PROPRIOCEPTUAL
GENETIC CODING TOWARD PERFORMANCE
DEVELOPMENTAL LEVELS
INFORMATION (Input) MODES
Hearing
Moving
Saying
Seeing
Smelling
Tasting
Touching
EXPLORATORY ACTIVATION
SCANNING MECHANISM of the INTEGRATIVE SYSTEM
ORGANIZED ACTIVITY
PERFORMANCE (Output) SYSTEM
Action
Audition
Gustation
Language
Olfaction
Taction
Vision
FEEDBACK MECHANISMS of the INTEGRATIVE SYSTEM

Figure 1. The functional systems of learning

Listed here are more than the conventional five senses. One of them, moving, provides us with essential information about ourselves in relationship to the temporal and spatial worlds in which we live. Such information is needed, not only for success in the gym and on the playground, but also for success in math, science, and certain reading skills. For example, by moving we learn that time is on a continuum.

Saying is another important information mode. Not only does it help us find out who we are by the vocalizations we make and to which other people react, but also, as we grow older we put more and more of our learning system into practice by putting ideas into words. We put ideas into words not only to communicate the ideas to others but also to clarify them for ourselves by conceptualizing moving, conceptualizing what we hear and see, and conceptualizing experiences into new dimensions and boundaries. The different aspects of language,

The information processing modes are turned on reflexively through biochemicals that say, "Now is the time to practice this because you'll need it to deal with the environmental demands." No information from the outside world enters the inner world in its original form; the information is translated first into electrochemical signals and then is organized meaningfully. I think this is the underlying purpose of the growth of the learning system. The purpose of the genetic coding written at conception is a biological mandate for the learning system in organizing information about the outside world into increasingly workable units so that we can cope with the world around us more efficiently and more economically. The entire development of the learning process is aimed at fulfilling this mandate.

From the basic signals we get from our muscles and joints at the proprioceptual level, we begin to organize the information of the outside world in relationship to our inside world. We begin to organize these data in terms of how we feel ourselves move through time and space in response to environmental demands. Then we begin to practice, organize, and refine each information mode so that the information received through it about the outside world becomes clearer and more readily usable. This is labeled the "preceptual" level of integration; it is not a play on words, but indicates a precept or order to practice each of these modes individually. We can see youngsters doing this. Someday, as a part of higher education, we will have baby watching along with girl watching, and will learn a good deal about the development of the information processing modes.

Sometimes we practice these for many years without too much consequence. Nevertheless, the nature of the learning system is such that when a traditional learning tool like the lecture is used, about 80 percent of what you hear cannot be retained; only about 2 or 3 percent of what you do retain can be applied because it must first be integrated with past experiences to become meaningful. Nevertheless, we resort to lecturing because this is what we are accustomed to and comfortable with.

After we have practiced and refined our information modes, we are still dealing with a population of ideas that is untenable in size. We must narrow it down to make it more economical and efficient to use. We can do this through the creation of mental images that take information from two or more of our information processing modes and put them together in clear fashion. The mental images we have labeled "percepts." I don't believe we are capable of a mental image that is a pure visual, auditory, or tactual percept. Try to have an image in your mind that is purely from one mode. I think the percept itself is a synthesis of information two two or more modes. The population of percepts is a much more workable population of ideas than is that at the preceptual level. However, it is still insufficiently organized to guarantee effective coping with the outside world.

Once we have a population of clear, meaningful percepts, we begin to organize them into categories of cause and effect in terms of classification and seriation so that we develop conceptual boundaries that surround certain groups of ideas. Then we can deal with that group of ideas as a unit. This is a much more economical and usable population of ideas than what originally came into the information processing modes.

Finally, when all the information we have received from our past experiences aligns correctly, the light bulb flashes. We have a sense of knowing and this is labeled the "cognitive" level of integration. This level of integration does not always indicate *accurate* information, however. Prejudices are at the cognitive level. We feel our prejudices throughout the entire learning system. Any cue we get from any of the information modes is able to trigger a prejudice. A prejudice is an idea we have lived with and have integrated well enough over a long period of time so that it is readily available for use. Many maladaptations are well integrated.

We also have an internal scanning mechanism that quickly sorts past experiences electrochemically and brings to the fore those best suited to help cope with current demands. That information, in turn, is relayed to innumerable feedback mechanisms which act almost as orchestra leaders, illiciting more from a given information processing mode, or a little less response at a particular moment, resulting in a balance between what information we receive about the environment and how we respond to it. Again, the feedback mechanisms are in the service of optimal response to the demands made on us by the environment.

As the information from the scanning mechanism is fed into the feedback mechanisms, we have a potential organization of response that can be optimally effective. The learning system enables most of the organism to be called into play regardless of the specific demand of the task. The task does not call only for seeing, or moving, or hearing. We have to think about this in terms of curriculum design and in terms of labels on workbooks. But as far as the organism is concerned, we cannot relegate a response only to a pair of eyeballs or to an efferent neuron. We have the totality of the organism involved. The totality of the organism involves not only getting information about the environment, but organizing and utilizing it in the service of a response that is as efficient and effective as possible for that stage of the organism's development.

I am sure that, five years from now, much more will be known about how the learning system functions. If, for now, we recognize at least this much of it, we have the opportunity to observe how a child goes about getting information from the environment, how that information is retained and integrated, and whether it is available for use. Thus, we can have an indication of what kind of educational planning and experiences he needs in order to receive information accurately from the outside world and respond to it in a cohesive, organized fashion. However, that is not possible if we follow the prototype of education with which we have had the most experience. We must fight against our own learning systems and break with the prototype with which we have become so comfortable.

We must do this because we read in report after report that 20 percent of our youngsters are unable to learn in conventional classrooms, and millions of dollars are wasted yearly in education because we are not reaching the youngsters. We have an increasing number of dropouts. We have increasing numbers going into special education; of them, more and more are staying there. The United States Department of Labor reports that in the long run, it costs us approximately $50,000 for each person who does not make it in the school system. It costs us not only for special education and perhaps incarceration in penal institutions, but also for loss of income and tax revenue. In terms of the fiscal loss, the loss in human potential, the loss of self-esteem of those children who fail, and the loss of self-respect on the part of teachers who have become purveyors of frustration, we can no longer be comfortable with the old system of education. We are faced with the necessity to change so that we can develop an educational system that promotes learning.

I suggest we begin by learning a six-point matrix of skills as prerequisite to doing prescriptive teaching. The first skill is that of learning how to observe the child during his performance of whatever he is asked to do. This concept has been advocated by Piaget for many years. Teachers, especially, have the opportunity to make reliable observations because they can observe the child on successive days over a long period of time. When accurately made, such observations can have a reliability and validity far beyond that of most standardized tests. Teachers can learn how to observe the totality of behavior, not only how the child responds educationally, but how he responds with the basic component skills that are prerequisite to his educational response. Teachers can learn to observe the importance and interaction of emotional and past experiential factors on the totality of the child's response.

Again, however, teachers are more comfortable with looking at test scores. Test scores are the end result of what somebody else did some time ago; they tend to attach labels to children, as do the reports from last year's teacher. Although there is some value to be gained from somebody else's labels, for the most part they do not help this year's teacher to plan effectively for her students. The most meaningful prescriptive teaching is ongoing observation of students' actual performance.

The second point is task analysis. We do not analyze most of the tasks we ask children to do. We don't analyze the specific qiestions that a task asks of a child, and the sequence in which the questions are asked. It is much easier to follow the curriculum guide or the label put on the workbook by the publisher. As a result, we have little idea of what a task really means to a child; and consequently, we rarely know whether a child is developmentally ready for what the task requires of him. As an example, before we ask a child to perform a task in the gym, do we know the likelihood of his breaking a bone or getting an epiphyseal separation while trying to do it?

Teachers can form a habit of determining the demands that tasks require of children and observing how children respond to those tasks. Several recent surveys indicate that as a profession, teachers show a great deal of discontent primarily because they feel that they are not accomplishing the job they would like to do. Most teachers feel they have not had the training nor the tools that would enable them to do the job that they want to do. To learn to analyze tasks and observe performance is not easy, but we can convince ourselves to do it by realizing that it supplies the needed tools for doing the job that we as teachers want to do.

The third point in the skill matrix for prescriptive teaching is to understand the child's response in terms of the developmental sequence or emergence of the skills he is using. For example, it is important for teachers, especially for physical educators who deal with children's movement through space, to recognize that the eye bone is connected to the mouth bone. They should know that the eye is basically designed to assess and guide the body through space. First we explore with our mouth, then with our hands; later we let our eyes reach out and grasp information about the world. Hence, developmentally, the eye bone is connected to the mouth bone.

If we learn how to observe the ongoing nature of the child's reactions as a total organism, and couple those observations with knowledge not only of what the task requires of the child, but also with the developmental emergence of the learning skills, we can begin to make a prescription for the child in keeping with his developmental and educational needs. Such a prescription provides us the opportunity to proceed in education as a science, not as a mystique. We no longer can afford for education to be a mystique done well by a few intuitive teachers who cannot analyze their creativity and share the factors of their success with others. We need to understand the way in which a child performs and how he fails and succeeds. We need to know which of his information modes work or don't work, and under what circumstances. We need to know how he uses the information he receives through those modes, how much of that information becomes integrated into his learning system, and how much of him is called into response to an environmental demand.

When we know these factors, we can proceed specifically with prescriptive teaching. We can outline the child's assets and deficits. We can state, beside each deficit, the behavioral objective he needs to reach in the immediate future. We are able to diagram where he is now, not so he can please the teacher or receive an "A," but to determine his needs in relation to his own development and ability to cope with his environment.

After the behavioral objective is established, we can list teaching techniques by which we can provide the child with an opportunity to overcome his deficit and achieve the skill he needs to cope with the environment. These techniques can be listed in a hierarchy, from the least complicated to the most difficult. Then we can try them one at a time and receive feedback information on how each works in helping the child to achieve that specific objective. If one approach fails, then, after getting the necessary feedback about it over a period of time, additional techniques can be used to achieve the goal. In this way, we can teach in a scientific method.

When we can approach education from such a vantage point, we can use group activity as an opportunity for learning. Then we can allow youngsters to learn as they do naturally, in that big classroom outside school called the world. Activity groupings allow the teacher to break with the past, to be an orchestrator of learning opportunities rather than the prototypal status fount of all wisdom. The teacher than provides opportunities for children to be active in learning, to do that which most interests them and which makes concepts alive and meaningful.

Then, rather than being concerned about having 30 or more individuals in the class and not being able to care for them all properly, the teacher can be comfortable orchestrating five or six groups of five or six children each. Then children need not wait in line in the gym for their one turn of the period to do "their thing." Instead, they can spend a physical education period actively by indulging in more than one activity during such a period. If the purposes of physical education are to help children learn movement skills and refine their visual assessment of space as well as their visual steering of movement through space, they must be active. Waiting in line does not offer activity, it only gives them an opportunity to become fidgetv or get into trouble.

As the teacher can feel comfortable as an orchestrator of activities, he actually will find more time to observe children performing and to provide individual attention to help youngsters in their development.

The sixth skill needed for prescriptive teaching concerns helping youngsters learn how to be boss of themselves. Education legitimately should educate the whole child. Learning to be boss of one's self is a legitimate part of education; therefore, it rightfully should be a part of daily classroom activity. Regardless of what the curriculum or school code says, a child cannot leave his feelings, maladaptations or behavior behind when he enters the classroom. Some teachers intuitively have handled this aspect of education well. It is urgently necessary, however, that *all* teachers be able to handle it well.

Children need to learn how they influence others in the group, and how others influence them. They need to learn how their actions and feelings affect others and vice versa. They need to learn how to mediate their emotions and impulses to benefit more from being in the group and interacting with others. Such skills will be of paramount importance to them throughout their lives—on their jobs, in marriage, with their children, and in recreation, as well as in other aspects of living. We cannot afford to fail children by not realizing that this is an integral part of education.

The six-point skill matrix is not a cure-all. It simply is a set of ideas that we can learn over a period of time through in-service training, since these ideas are not yet taught formally in teacher training. Teachers who learn this skill matrix have a mental crucible in which they can evaluate, grind down, and apply that which is helpful from research concerning the needs of their children. In this way, teachers can provide their students with successful opportunities for learning, as well as provide themselves with opportunities for greater teaching success. Teachers can thereby gain the gratification they seek when they leave school at the end of the day, the gratification that comes from knowing they have fulfilled the responsibilities of their profession.

THE LEARNING PROCESS – DEVELOPMENT AND ENHANCEMENT

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Ladies and gentlemen, those of us present and the persons we represent in the field of education are the daily participants and observers of the constant creative ability of human lives. Working and living in these capacities, each of us unconsciously lives each day with three very disturbing and perhaps brutal facts.

The first of these facts is that no human being–child or adult–is becoming what he might become. Second, the potential for human becoming is only dimly seen in our culture and perhaps less well seen in many other cultures of the world. We do not have a picture of what a human can be and what he will become. The third disturbing fact is perhaps the most brutal: not enough people care.

A human being can become only in terms of what the conditions influencing his becoming will permit for him. If we expect greater fulfillment on the part of human beings, something must happen to change the influencing conditions that are at work. At the moment, these conditions are poor. When we are told that there are 15 million American children between the ages of three and six already doomed to failure in schools, and that one out of every 8 college students is seriously psychologically disturbed, this is enough. When we are told that the rate of percentages of preadolescents and adolescents committing suicide doubles every 10 years, this tells us something about the conditions under which our human beings are developing.

Although it is extremely difficult to come by these figures with any marked degree of accuracy, let's assume that these statements are at least half true. If this is the case, someone must go to work. The key person in this culture who can go to work and do something about the conditions influencing human becoming is the educator.

The educator is the only professionally prepared person who has a daily influence on what happens to human beings' chances of becoming a fuller self. The educator is the one person known in the community who can influence not only children but also the children's families. The children who come to the educator represent a captive audience. They have no choice in coming and we have no choice in being influential. We can influence for good or for bad and our influence is tremendous.

In a county of our state, one of our staff members, with the permission of local teachers, visited each school and every fifth teacher on the payroll. He recorded the teacher's statements during three 30-minute visits–an hour and a half for one semester. During these visits, the statements were counted. One teacher made as many as 258 separate statements in three 30-minute periods. That is an influence, and the quality of what goes on in the school is reflected by the selection statements that are made by the teacher. Those more than 250 statements came from the quietest teacher in the county.

One of our teachers made 648 discrete statements in three 30-minute periods. All teachers averaged 435 for one hour and a half during one semester at school. This is a tremendous influence which can go a long way toward improving the conditions under which human beings develop so that they have a chance to achieve self-realization. We in education need to ask, where do we start.

We start wherever we are because there is a significant rule for each of us. We do not have to be in key places. Wherever we are at the moment is a key place. If you are an educator and entrusted with that opportunity, you have the chance to live the most significant of human lives. In the process of promoting the development of individuals and enhancing this development along the way we need to think about how this is done.

Many people think about a human being as they think about a plant. That there is a seed, there is a sprout, there is this stage, and this stage, and this stage. At each stage the human being is like this, does these things, and therefore, needs this. That's orderly, beautiful, simple, and we love it. But unfortunately, it isn't true. What we seem to come up with in terms of a set of averages or norms does not seem to apply to any one particular individual. They do not apply because we're establishing or attempting to establish norms for human behavior on the basis of a theory that says that the human being unfolds in the story of his becoming. Genetically, a human being does unfold. However, this process does not make a quality human being. A human being becomes a quality person, not so much through unfolding, as through other, more influential processes. These processes are primarily those of interacting and interrelating.

In terms of the interactions and interrelations which growing boys and girls experience, this is where the educators has the opportunity to live the most significant of lives. Theoretically, a relationship and an interaction exist on a worldwide basis. It is like dropping a pebble on the water. There is no end to the wave. I relate to you, and you in turn relate to others, while I go on relating to others. One human being does not become unless all human beings become.

When you reach out to help another person, you are reaching out not just to one, but to all, including yourself. When you abandon, reject, or neglect one other human being, you are rejecting all, including yourself. Human becoming cannot be reserved for an elite group of people. There is no such thing. Any human being who is privileged to influence the becoming of others is indeed the man of the hour. He has the opportunity to exert positive influence on the quality of the relationships and interactions which will have the most significant impact on the "ongoingness" that characterizes the development of that human being.

Those of us responsible for the quality of the relationships and interactions need some direction. Fortunately, directions are coming to us from many sources. In our particular culture, at this time, we are most fortunate in having a large number of theories about the direction of human becoming which are advancing a number of ideas about the future development of individual human beings. While there is healthy disagreement among these theories, there is also amazing commonality. I should like to offer some directions for further becoming.

I'd like to start by taking the directions offered by Dr. Lawrence Kube, who has written extensively about human becoming. Dr. Kube has said that educators are interested in producing well people, and they they want to avoid producing ill people. He describes a well person as someone who is open, dynamic, ongoing, and flexible. He can take on a new idea, a new direction, a new moral realignment, a new value commitment. He can come up with new goals and new directions. He can extend his own creativeness and contribute to the creativeness of others. He can contribute through group interaction and discussion. He can profit from the ideas of others in group interaction and group discussion and he can learn through his feelings. He can make positive contributions to the development of others.

At the other extreme, Dr. Kube describes the ill person as one who is frozen, fixed, and finalized, unable to change, move, or help others because he cannot help himself. These persons go through life licking their own wounds. Dr. Kube is describing two extremes, and in doing so, he is talking about the end product.

It is possible to take his ideas and put them in another way for our thinking. It's entirely possible that the open, dynamic, flexible human being becomes that way because he grows up under conditions, relationships, and experiences that are also open, dynamic, and flexible. And it's entirely possible that the person who becomes a fixed, frozen, finalized human being grows up under conditions that are fixed, frozen, finalized.

What about these conditions in school? Would you characterize your programs as being frozen, fixed, and finalized? In most classrooms we say there are three reading groups where all youngsters are learning the same vocabulary. In specialized classrooms we're saying that all children experience the same art media at the same time, with the same directions. In physical education, we're saying that all children are standing in line waiting for a turn while learning where the fixed spot is. How frozen, how rigid, how finalized is what you do?

Oh, it's easy to answer some of these things. We have to have the line. Excuse me, I prefer another phrase. We have to have the lineup. We only have one set of parallel bars. We only have this kind of setup because of this situation. I do not believe that our inventiveness and creativeness stop there or that we are limited by such simple physical handicaps. I believe we can have a program marked with flexibility and openness, as well as with full opportunity for change, development, and extension. Dr. Kube is offering us a very important direction to influence the further becoming of human beings.

Let me move from one individual to a large group of individuals who also are telling us much about the direction for the future becoming of human beings. I refer to the behavioral scientists. They talk with us in very simple terms about promoting a healthy self-concept. They talk about very basic dynamics that are important to educators because they are saying that we are interested in producing well people. A well human being is someone who sees himself positively, is comfortable with himself, and holds himself in the highest esteem.

The ill person has a defeated self-concept, and holds himself in low esteem. We're concerned about how people regard themselves because their self-concept determines whether or not they will learn. We are flooded at the moment with numerous research efforts that tell us if we believe in youngsters and believe they can learn something, they can. Youngsters accomplish when *we* believe. We transfer that belief to them, and only the individual himself can make the change in his own self-concept. We want to facilitate the role of the individual in developing a good feeling about himself.

The behavioral scientists are saying that a human being who sees himself positively knows a great deal about himself–his strengths, weaknesses, abilities, and foibles. He not only knows these qualities, but values what he knows and attaches high value to his strengths. Through this attachment of value to his strengths, the individual comes out with a total value of thee self that says, "I am significant, I count, and I have every reason to feel good about myself as a human being." When one feels this way, one undergoes less anxiety and frustration. A human being who is relatively free from anxiety is in a good position to learn and develop because he can see the world realistically. Although every human perception is a distortion to some extent, the person who has less anxiety undergoes less distortion of his perceptions. This is a great asset in learning, not necessarily in learning that which is taught in school, but a great asset in learning things that require a higher level of the mental processes. Many youngsters who achieve at extremely high levels in school are highly anxious individuals. This does not mean that they are necessarily dealing with things at the very complex level.

When we look at what the behavioral scientists say, we are still faced with the problem of what we do in education, what directions do we have, where can be go. I should like to offer a theoretical framework for enhancing the development of individuals through the learning process based on several conditions.

The first condition is that any time you look at a major problem such as developing positive self-feelings within individuals, you won't be able to do it by having a handful of techniques or a series of steps, "one," "two," "three" of how you do this. Second, we have learned that any time you look at a problem of major significance, you can use some techniques of the scientific method, such as a framework for focusing on the problem.

One such framework–the family framework–belongs to those of us in the school setting. It can be examined, extended, and developed for zeroing in on the totality of the problem so that we may assist individuals to see themselves more positively.

I should like to start this framework by turning a spotlight on the role of the teacher. A teacher is with youngsters with no other adult around. What can that teacher do, and what does a teacher have at her disposal that can be used? What are the guidelines?

The first guideline is to do whatever is possible to help youngsters learn whatever is expected in the program. If you are teaching arithmetic, this means you become very skilled in teaching arithmetic so that youngsters can progress in learning it.

If you are teaching the high jump, it means becoming very skilled in whatever you need to know to assist the learning process. Sometimes we fail in this because of our own rigidity. One of our records from a small boy says, "Here I am in junior high; there are 860 of us. I am the smallest boy. There are three girls of the 860 who are smaller." He knows because he has cased it out. In gym, he gets in line for the high jump. He takes the long run down and when he gets to the place, he just stops, turns around, comes back, and gets in the line. It's all right; the coach knows that although he can't do that, he can do many other things. Handling size is one of the most difficult things that he deals with. Learning and achieving, whatever the expectancy is an important guideline in promoting mentally healthy people and a good feeling about oneself.

In any educational setting there is a moment by moment feedback to a youngster that says he is doing all right. He is accomplishing what society expects him to accomplish. In some cases he is learning a marketable skill. In other cases he is learning what his parents want him to achieve. He is learning what other people are learning. He can look around and see how others are doing, and there is a moment by moment feedback in achieving what is expected which can contribute to the enhancement or defeat of oneself. A widespread educational practice that deters the development of a positive self-concept is public evaluation of an individual. This practice is common in health and physical education classes. There is little that we can do to avoid the feedback that comes through public evaluation of youngsters. They are on the spot every time they try to do something. Achievement of what is expected builds a healthy and positive feeling about oneself. It imposes upon teachers the obligation to become as skilled as possible in helping youngsters to become as knowledgeable as possible. We don't always demonstrate this capacity.

The National Association of Social Studies sent a group of people around the world to check on the geographies used in this country. During the three-year tour they found that the geographies being used were wrong more than half the time when checked against conditions in the foreign culture. How about physical education? How many seventh graders are expected to perform on parallel bars? Two-thirds of them lack the shoulder development that this activity requires. How accurate are we? How proficient? How sound are our practices? If we establish impossible tasks, youngsters cannot achieve or get feedback that assures that they are doing all right and are moving along well with the expectations.

Of course, achieving what is expected must occur in a particular kind of climate. We have chosen to call this climate a *valuing climate.* An evaluating climate can be established only by a valuing agent. We hope every human being who has the opportunity to be a teacher is a valuing human being. The term "valuing" is chosen purposely because it's an active term. Someone who values is busily using his time, energy, and resources to promote the becoming of other people. A valuing person can do more than what he alone is responsible for. He can communicate the valuing processes to other youngsters. These youngsters, in turn, can become valuing agents who can add to the intensity of the health of the existing climate which influences the further becoming of human beings. We need this kind of climate because it's the only climate we know in which a human being can feel absolutely safe and free to probe fully the experiences at hand for the full meanings that can come to the human being. It is important that the child be allowed to probe fully whatever is offered. He should be given the opportunity to experience safely and freely the full meanings that can come to him without the fear that he will be judged inadequate or incapable. Very few educational settings, if any, could be characterized in this way. We have built into our system all kinds of automatic things that stand as threats to human beings.

A youngster quickly learns that if he's writing a story, he should write it only one page long. His chances of making errors are much greater if he writes a three-page story. If he's assigned to write a business letter, he learns to stop with one paragraph because he may forget to indent the second one. We are loaded with all kinds of practices, of threatening youngsters that they will be moved from one group to another with the grades that will come at the end of six weeks, with retentions, and with promotion, rewards, and punishments. Youngsters learn the system. Very few of them feel absolutely free and safe to probe fully what is offered for the total meanings that can come to them as learners. We need an atmosphere in which this can be done.

We in education must count heavily on a very basic motivational truth that resides in every human being. There is in every human being a basic urge to grow, to extend himself, a central pushing that says I want to amount to something and am willing to work and learn what is necessary in order to achieve something. What we forget is that this desire is largely shaped by the human being himself. The human being shapes his urge to grow in the direction of learning that which will enable him to be effective in his own private world. Many youngsters live in a private world that calls for skills that we know little about.

It's been my privilege to be associated with the study of youngsters conducted by the Washington School of Psychiatry under the direction of Dr. Ruth Newman. These youngsters are junior high school students and the schools that refer them to the study call them nonlearners. Dr. Newman says they learn extremely well and they learn very complex things.

Many of these youngsters could go with you this afternoon just four floors down to Pogue's Department Store. They can pick up whatever they want. They have the skill to park these items on you, follow you out of the store, and lift the items from you without your ever knowing that you've been involved. There is nothing wrong with their motor ability or perceptual capacity. They are extremely skilled. But, they are all classified as nonlearners in school. They have been shaping the urge to grow, and learn what they need to know to be effective in their world because they know they are not wanted in school. They know exactly what to do to get expelled in the next 15 minutes to avoid an English test and how to get a three-day suspension as distinguished from a semester expulsion. They can draw the line—very bright, able youngsters. They know how to handle a policeman on the corner; they know how to get kicked out of their homes. They learn how to handle a world that does not want them. We have many, many youngsters in this kind of struggle. Fortunately, this urge to grow can be influenced.

The urge to grow is influenced in strong measure by other human beings. It is hoped that those in education will be a significant influence in shaping this urge to grow. It is hoped that teachers can help youngsters gain a different concept of what the private world is like and what it can be and what kinds of roads individuals can have in the private world. One of the biggest challenges we face in working with youngsters in so-called poverty areas is to help them reinterpret the meaning of the world in which they live, to grasp new meanings, and to get different concepts of what their horizons can be.

Most of us have great difficulty in doing this because we cannot forget ourselves. Our own cultures and behavior stand in the way of our becoming significant to others. We still insist on the accomplishment of certain skills at a specified time; we are still concerned with correct usage of the English language although some of the language that youngsters have communicates extremely well; we are still unable to tolerate dirt and cannot accept some of the smells that we live with in various situations. Only through forgetting ourselves and influencing the urge to grow can we fully achieve the opportunity of significance that is fundamentally ours. Then, teachers have a tremendous opportunity to work with youngsters through tapping their knowledge. How do they grow, why do they behave as they do, how do they learn, what produces emotion, and how do they adjust?

We talk about the necessity of understanding the human being as though it had already been accomplished. We've all had courses in it, but that's all. The institute that I serve works directly with some 4,000 to 7,000 teachers across this country and other countries. Its purpose is to help teachers understand the dynamics that stir individual children to action. We have been doing this for some 24 years.

Our problems fall along these lines. Understanding human beings is not seen as being innovative. Yet it is one of the most innovative things needed at the moment. It is not seen as something that is dramatic and can occur in six months. That is right, it cannot. It takes time. It takes hard work. It calls for a commitment today. If you think that you understood human beings 10 or 15 years ago, you need to think again, because today's children are not the children we had 15 years ago. They are reaching greater biological fulfillment; they are reaching it earlier; they have greater intellectual sophistication; they have more knowledge. Yet they live in the most compartmentalized kinds of existence that youngsters have experienced in the history of our culture. This calls for new understandings.

This says to us that we need to know what a child is working on, what he is up against, what his assets are. It's on the basis of full answers to these questions that we're able to take a stand at examining what the school is doing to help him and looking further at what the school can do to help him.

Here are some beginning guidelines in the spotlight of looking at the roles of the teacher.

- Assisting people in accomplishing the expectancies
- Doing so in an evaluating climate
- Relying very heavily on the motivational force that says that all human beings have an urge to grow and this includes learning because we learn all that we become—we even learn our maladaptations. Learning and self-development are synonymous (terms and synonymous processes). We can facilitate much of this through using the knowledge that is at hand about individual members in a school setting.

A teacher is not alone, so let's turn to a second spotlight and look briefly at the role of specialized people who can assist teachers in facilitating the development of others. Every school system has specialized persons who can serve as resource people. Often we think that if these people are not on the school payroll, they do not exist. But it is possible to use a public health nurse, a physician, or a knowledgeable patron living in the community. Every school system has and needs knowledgeable people who can help. Unfortunately, we have developed practices that make it difficult to utilize the services of these people.

In our institute we had a foreign student from India who spent some time with us and one day came to the large outer entry office and just began clapping her hands until she attracted the attention of all the people who were in their own individual offices surrounding the larger area. All the people got up from their desks to come out to see what was going on. Margaret Rose Frances said, "I've been living here for some time, and I have an observation to make. I now know why you people never get anything done. Your country is too rich and you have too much paper. And as long as you have your paper and your telephones and your familiar responsibilities, and as long as you spend so much time interacting with each other, you will never get out and give assistance to the people who need you." This is happening in school system after school system across the country. We need to work in such a way that our specialized persons are available to the teacher in the laboratory setting, in the classroom, on the field, wherever learning is fostered. There are so many things that they are able to do. One of the things they can help us do is to evaluate current conditions.

Unfortunately, so much of our evaluation is in terms of what has been learned. We use a particular test to make an assessment. We rely very heavily on achievement test scores, I.Q. scores, and scores of other tests in highly specialized areas. For the most part, these instruments tell us something about what has been accomplished. Perhaps our special personnel can help us evaluate what is going on at the moment that will result in accomplishments 10, 15, 20, 30 thirty years from now. It may call for very different directions, such as those suggested by John Lithal in his early attempts to assess the emotional climate of the learning setting. Or, it may go in the direction of looking at the works of Kurt Stevens, Hugh Perkins, Bob Fox, and many others in various ways to assess the interaction that is going on.

Human beings become in terms of the quality of interactions that they experience. It may go in the direction of using personality inventories. We've used and interpreted them very crudely and we're in trouble. Yet, they can be very useful, and we need to explore them further.

We can go in the direction of using the host of self-concept scales that are available. We even have some self-concept scales for nursery and kindergarten youngsters through the use of stick figures. There's no reason why we can't look in the direction of what is the present situation doing that will influence becoming 10 to 30 years from now. This may be an important direction.

Our special personnel people need to help us in building into our very beings a basic code of professional ethics. In many situations in education we do not have that. If we did, you would not hear the kinds of conversations that you hear in the teachers' lounge. We would be extremely careful about sharing the knowledge of one human being so openly and freely and sometimes critically with another human being. This practice is nonprofessional. Sometimes we even share knowledge about one parent to another parent, or about one child of one parent to the parent of another child.

We need a strong code of professional ethics before we can accomplish other things. For example, our specialized school personnel could help develop professional records about youngsters that could be passed on from one year to the next. I cannot envisage a professional person spending a year with a child and having no more to say than "it was nice having Johnny in my room." This is passed on to the next professional person who will spend a year influencing that youngster. We need very objective and useful personnel records on youngsters that we cannot get until we have a code of ethics. There is a very definite role for the specialized school personnel. They can say to us over and over that the teacher is not alone and here is a backup resource.

Let's look briefly at another spotlight–the school curriculum. What goes into a school curriculum? A teacher is not alone here. She has some curriculum guides that can be useful. Sometimes they are not very useful. One of the big things that must characterize a school curriculum is flexibility. It must be open and subject to change. It must be the kind of a thing the teacher can use and depart from so that she can decide what is right for this group at this time and what is right for this individual at this time.

We have people standing up at national conventions saying this curriculum material is so good that it is teacher proof, meaning that no teacher can louse it up. That kind of person should not be working with a teacher because he does not see the teacher as a competent, professional adult. Any competent professional adult should have the opportunity to modify what is expected so that it is appropriate for a particular individual, group, or situation. There must be flexibility. The school curriculum must involve the best scholars available to help us develop it. Sometimes scholars are willing to work in this area, but unfortunately, they often work alone. They develop marvelous materials that come to the school on Monday morning in mimeographed form with questions and blanks for the children to fill in during the next four days; then on Friday, there is a test in terms of how well they've done it. This is not education, and many educators are rejecting it.

We must involve the best scholars to help us evolve the best curriculum guides possible. Of course, there are some old-fashioned ideas in the school curriculum that must be maintained. One of these is the readiness of children. We're developing all kinds of instruments for assessing the readiness of youngsters to learn certain skills and knowledge. Unfortunately, we are putting the onus on the wrong foot. It's not a question of whether the child is ready, but whether the school is ready. Every child is ready to learn. He's ready to learn what is next in the story of his own development as a full person. Any school worth its salt is prepared to offer him what he needs when he needs it.

A second concept we need to maintain is the importance of individual differences. Although that concept has been with us for at least 40 years, it is still overlooked, particularly in your field. We still expect people to accomplish the same thing in the same way in many settings. But unfortunately, we have been looking at this concept in a little different way. One of our doctoral students taught for the first time in a situation where Negro and white youngsters were placed together. One the basis of his results he found that one group scored much higher than the other. When they came in, the white children sat in two rows on one side of the room; the Negro children sat in two rows on the other side of the room. There were two rows of vacant chairs between them. He took the test results and decided he would strike the average. It took him six weeks to discover that he was teaching two vacant rows of chairs. Sometimes we deal with individual differences in this way–waiting for some to catch up and holding back the development of others.

Sometimes the concept of individual differences leads us astray because we think that this IQ is different from this one, this body build is different from that one, this social class is different from this one. It's not so much the differences we're concerned about as it is the understanding, the uniqueness of this particular individual. Dealing with that uniqueness is the important thing.

We must be concerned about meeting the needs of youngsters. That's an old 79 cent economy phrase we use when we don't know what else to say, or have a limited vocabulary, or want to cut off discussion. Think of it in two ways. If you're thinking of the needs as the learners themselves receive these needs, that's tremendously important. However, you must also think in terms of the needs of the learners as these needs are known and understood by the competent, professional adult educator in charge. The art of education lies in bringing these two together, which, if accomplished, insures that the program is not completely determined by the adult. The program is not frozen or rigid because learners will make the difference in reaching out for different kinds of things, in using the urge to grow to find their own learning goals, to select individual projects, and to move in may different ways. This is the concept of meeting the individual needs of human beings.

Every area in the school curriculum ought to provide feedback to an individual that tells him about himself. Literature has amazing possibilities if we aren't stuck with commas, word usage, similies, and the like. Instead, look at the basic human themes in literature–love, hate, aggression, and ambition. These are the kinds of things that can tell a human being about himself.

Those of you in physical education have a tremendous opportunity to help a human being learn about himself and his potentials and create a tremendous orbit in which he can try things with support and a reasonable degree of safety. Every area of the school curriculum should be greatly concerned about zeroing in on big unifying ideas that are important for human beings to possess as part of their makeup. So often these minute skills and little bits of knowledge do not add up anything. If these things can add up to unifying meanings, then the little facts we learn along the way have a chance of being meaningful. As the big ideas become clear, their significance is no longer needed. In many fields we are doing this. Many of you are doing it in education perceptuality where you're using a big unifying idea such as life comes from life. If you build experiences around this kind of concept there is no end to what you can do at any level of development to help a youngster grow in this meaning and in other meanings in this one field.

I turn briefly to a fourth spotlight–the role of the school administrator. Perhaps you would like to skip administration. I can talk about it because, in part, it is one of my roles. Teachers are not alone; the curriculum doesn't do it all; we're not altogether dependent upon specialized personnel. The school administration also has a share in molding the development of healthy concepts. An administrator must have flexibility. He must encourage all kinds of development, new efforts, and trials. He must be supporting and do all he can to help the person who is venturing forth. He cannot expect all people to venture forth in the same way at the same time with the same degree of skill and accomplishment.

A teacher's husband traveled frequently. To allay her loneliness, the teacher visited the home of every first grader before Thanksgiving. Her principal thought this was such a wonderful idea that she said all teachers would do it next year. Sometimes we behave this way as administrators.

As administrators we must follow sound principles of learning and apply them to the adults with whom we work. A principle of learning that is sound with an adult is also sound with a three-year-old. Let me offer you one such principle from Ginny Hines' writings about three-year-olds. She says that the most effective way to get a child to do what you don't want is to require it. If you really want it, stir interest. This will work with three-year-olds; it will work with 40-year-olds. Many administrators forget this principle. Administrators have a key responsibility to promote good psychological conditions for the total learning setting and to be concerned with teachers' mental health.

A key factor in this is to involve as many people as possible in as many decision-making processes as possible so that everything is open. This enables everyone to express his ideas and through this process, the group is able to reach wise decisions. Sometimes administrators think their decisions are better than those arrived at by the group, so, in some cases, they give up on the group process. If they stay with it for a while, they will discover that decisions that are open and arrived at through thorough group discussion are much sounder than decisions made by any one individual. The very process adds to the significance of the people who participate and leaves them with full information. They do not go around worrying about unknowns and they have the opportunity to live in a healthier setting.

Administrators need to help us in the enhancement of the development of human beings and select the right people to work with youngsters. We can talk all we like about teacher education and certification. These are important, but there are other things that underline them that are not as important. People who work directly with youngsters should have basic love in their own lives so that they are secure. They should have the capacity to relate positively to others. They should have a strong commitment to education and believe in its power. There is not a single world problem that could not be greatly alleviated with improvements in education.

As a problem of major concern you need some way of capturing the totality of what is involved. This presentation is one framework that can be used for enhancing the development of individuals. The learning setting can be used by those persons who are responsible for what happens on a day to day process in determining the quality of better relationships and better actions to which an individual is exposed. In this you have an opportunity to live the most significant of lives and I would like to ask how significantly would you like to live?

CONCERNS OF THE PEDIATRICIAN FOR MOTOR DEVELOPMENT

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The pediatrician is concerned with child growth and development, both in *ease* and in *dis-ease.* Possibly his primary concern is with the prevention of dis-ease and the development of a normal healthy individual. His daily traffic with children provides a constant confirmation that "the child is father of the man" as Wordsworth said. He is, therefore, concerned also with providing children with an environment conducive to learning.

The child's earliest years involve sensory-motor development. Particularly during his first six years, the child is busy developing and refining skills to achieve mastery of his body as well as his environment. He is getting ready to develop intellectual skills for acquiring knowledge. The child seems to possess an inner guide which leads him to modify his ways of moving: the infant's movements are ceaseless and uncoordinated; the child of three is always on the move, often throwing himself on the ground, running around, and touching and handling everything; the nine-year-old walks and moves about, no longer feeling the need to stretch himself on the ground or grasp everything with which he comes in contact.

These modifications develop independently of any educational influence. They are partially associated with an external transformation of the proportions of the body betweeen the length of the trunk and the lower limbs. For a newborn child, the length of the trunk from the top of the head to the hollow of the groin is equal to 68 percent of the total length of the body; the legs represent 32 percent of the length. At three years of age, the child's legs correspond to 38 percent of his height (his torso about 62 percent), and then grow relative to the trunk until they greatly exceed these proportions in the adult; at 7 years of age the legs are already 75 percent of the height. After puberty the trunk grows until the child attains adult proportions, with torso and legs about equal in length.

Children's movement needs vary and we must make allowances for these variations which come with age. For example, children with their short legs (and large heads) make great efforts to establish perfect balance and, with a little run, they mask the difficulty of simple walking. A three-year-old must constantly modify his movements to maintain balance of his top-heavy body. Infants feel the need to rest by extending their trunks on the ground and raising their legis in the air; the child between 3 and 5 years of age rests by stretching himself prone on the ground, often elevating his shoulders by supporting himself on his elbows. At 6 years many children still enjoy sitting on the ground, using as a base the whole length of the crossed legs or the length of one leg with the other placed alongside; this seems to give them a wider base of support.

The child *develops movement in space.* How does a normal child perceive his space world in relation to position, sizes, distances, and shapes? Everything on earth derives its position from our own position and relation to the forces of gravity. In outer space there is no up or down. The pull of gravity gives us our concept of down. As we crawled and learned to balance ourselves in the upright position, we began to form concepts of other directions. Toward our feet–drawn by gravity–is *down.* Toward our head and away from the pull of gravity is *up.* Objects have right sides or left sides only because they are on the right or left of *us.* Writing starts on the left of the paper not because the paper has any particular leftness or rightness, but because of the paper's relationship to the left side of our body and because our particular culture says that we must read and write from left to right. *Behind you* is in back of you where you cannot see an object. *Behind the chair* is on the side of the chair away from your body where you can't see the object completely. Thus, objects in our environment have directions only in relation to us.

To achieve a stable space world, balance is necessary. When an infant first lifts his head up from the crib (whether in a prone position or on his stomach), his head will wabble and drop down again. With practice and clear kinesthetic messages from his muscles, tendons, the semicircular canals of his ears, etc., the infant learns to balance his head, he begins to understand the rudiments of up and down space. Up is directly above his line of vision; down is the surface of his bed or the floor. As a child learns to crawl, he has to make adjustments to keep his head and body balanced. As he pulls himself upright and begins to toddle, he must reorganize his body balance to avoid falling. As he develops through motor experiences, the infant continuously learns to adjust his body to balance in space.

As the child achieves stable balance in vertical space, he begins to develop a concept of horizontal and front-back space. An infant initially moves horizontally. To get some place while crawling, he must learn how to coordinate both sides of his body. As Dr. Gettman states, the child must learn that "his body is a duplex," and how to coordinate and integrate the two sides. He begins to learn the difference between the two sides of his body when he learns how one side counterbalances the other in crawling, utilizing reciprocal motion. He can hold an object in one hand and explore manually with the other. He learns a thousand ways of using his hands and legs, together or reciprocally, to achieve movement efficiency.

The child may find that one side of his body is more efficient than the other; the more efficient side may attain dominance at an early age. While establishing bilateral coordinations and laterality, the child also learns about his body parts–where they are, how to move them, what sensations they receive, how much room they require in space–and thereby develops his body image.

In addition, the child learns to interpret all of the information received through his senses. At first, he must use all of his senses to explore an object or a space. The hand is the child's first teacher. He learns to identify objects by touch, by feel, and by moving or manipulating; then he verifies the information with his eyes. He learns to coordinate the information coming in through his senses and to hook this up with movement (thus the hyphen in "perceptual-motor"). Experiences seem to be taken in through the senses, and the child works out meaning through his activity. This is a continuing learning process which may extend beyond the first six years, and thus it must be taken into account by teachers of primary grade children.

The importance of movement in the child's early learning experiences cannot be overemphasized. When he is very tiny, he learns the size of a room by the amount of energy and time it takes to crawl across it. He learns the shape of objects by manipulating them. He learns what his body can do by moving through space in many different ways. As he analyzes and integrates the elements of his movements and uses them in a variety of situations, he also achieves visual skill.

As he achieves perceptual maturity, then with his eyes alone he can judge distance and size relationships, positions, textures, and weight. But first his explorations must be tactile, kinesthetic, and through all forms of movement. He begins to explore with his eyes the way he previously did with his hands; then he integrates new visual information with all of his motor and sensory background. Ocular activity, motility, and perception become accurate in order to match the information that the child has hitherto accumulated via motor, tactile, auditory, kinesthetic, olfactory, and gustatory sensory channels. The visual mode finally becomes the most rapid, efficient mode of learning and seems to be taken for granted by schools today.

To make a good perceptual-motor match, the child must achieve balance, laterality, bilateral coordination, body image, and accurate visual perception. With these perceptions stabilized he can accurately relate objects in space to himself. The sentence, for example, starts on his *left*; he is to stand on the *right* side of his desk, put his hand *behind* his back; and place a book *inside* his desk. These examples illustrate "position in space" or "directionality." Children with specific reading disability often demonstrate major problems not only in spatial relations but in identification of "the little words" that relate to space, such as *in, on, under.*

When a child can project these relationships into space and see how objects relate to each other he is able to understand why the teacher wants him to start at the top of the page–which is related to the top of his head as he holds the paper vertically. The fork is on the left of the plate because it is on his left also. The *d* is on the left, the *g* is on the right, and the *o* is between the *d* and *g*. Letters and numerals can remain constant in the same static position, and the child is able to gain instant recognition from a stable, visual memory of the word or equation. His response to these objects will become automatic, requiring no analysis.

A child learns to compare sizes and shapes of objects by putting them one on top of or inside the other. A spoon is so little that many spoonfuls are required to fill a cup. A child can pick up a short rod easily in one hand but it takes both hands, arms, and a change of body posture to carry a long rod. He would rather have three pieces of candy than one or two because three pieces are more. The car looks little but then he discovers that it is just farther away. In learning to relate objects precisely, he has gained the basis for quantitative relationships–and a foundation for arithmetic. The importance of what has happened to the child's sensory-motor development before school is directly related to what happens to him in school.

Schools operate on certain assumptions that are erroneous. Two, in particular, are of interest at this point. The first is that all children are ready for school at age 6. Well, they are not all ready to give up their individual learning about movement, their individual perceptual-motor development, to move into one way of learning, namely, the use of eyes alone. All children are not prepared for academic learning at six. Some perceptual-motor activities may be helpful, even though they are not in the "academic" realm.

The second erroneous assumption is that all children are similar. Although we speak a great deal about individual differences, we do not always practice what we preach. As adults we want to be recognized for our individual differences, but often we do not treat children as individuals. Children are taught by methodology of the school system, which requires all children to learn in the same way, regardless of what is known about individual differences. Each child has spent 6 years developing in his own way, at his own rate; he has not been developing in the same way as the child next door, or even in the same way as his siblings. He cannot be expected to suddenly sit still and be the same as 30 other children in the room, for they are not identical.

By demanding that children be the same, we are not reaching every child. The estimate, depending on which book you read, is that 10 to 30 percent of our children have learning difficulties. The schools are not providing for them. The schools can provide for retarded children; they should be able to provide for all children with normal potential. It is time that the people who know most about physical skills become interested in their children and go into the schools to help.

CONCERNS OF THE PHYSICAL EDUCATOR FOR MOTOR DEVELOPMENT

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As a physical educator it is gratifying to me that the level of interest in activity programs for elementary school children has kept pace with the emphasis received by other areas of the curriculum. It is all the more rewarding because this popularity comes some years after it has been firmly established that the relationship between intelligence and proficiency in motor skills among healthy children is too low for predictive purposes (3,17,31). For one who functions within the educational community, this interest in motor skills represents a victory, for the pedagogic preoccupation for several decades has been with cognitive development.

Most physical educators are aware of the fallacy in attributing a cause-effect relationship to the association between motor skills and intelligence. Previous attempts to justify physical education programs on the basis of their contribution to intellectual development were ill-founded. Such attempts to broaden the base of support for physical education programs are history, and yet I have the impression that a large part of the current popularity of elementary school programs is based on the belief that physical activity serves as a precursor or useful adjunct to skills essential for academic achievement.

My task is to discuss the concerns which I, as a physical educator, have for motor development. For the purposes of this presentation I am including in motor development only those skills which (1) involve locomotion and balance and (2) are involved in the projection and reception of the body and external objects. The definition excludes prehension and tasks requiring primarily visual, auditory, and tactual involvement while the child is in a stationary position. The following six matters are of concern to me.

1. The Status of Knowledge in Motor Development. Motor development implies a sequential, orderly progression in fundamental movement patterns. Inspection of elementary school physical education curricula reveals that most programs are not based on the developmental needs of each child, but reflect the game-oriented approach to activity whereby highly skilled children are able to retain a large part of the action while the less skillful are maneuvered into positions where they receive little opportunity to participate. Movement education programs are exempted from the "games-oriented" label, but it is impossible to determine at this time whether these programs are more effective in meeting the developmental needs of the child than traditional programs.

This does not imply that the objective of fundamental skill development is unfamiliar to physical educators. It is universally stated as one of their goals. Why, then, has it been so difficult to translate this objective into practice? A primary reason is that research has provided an inadequate scientific basis for incorporating fundamental motor skills into the curriculum. The scientific basis to which I refer includes such information as (1) the intra- and inter-skill developmental sequences of all the fundamental skills, (2) identification of the biological signs of maturity indicators which suggest that children are ready to learn certain activities, (3) identification of the critical periods during which specific skills can be most efficiently learned, (4) objective evaluation of the results of enrichment programs which are initiated before or after the optimum periods for development, and (5) knowledge about the influence of teaching styles on the rates of learning in children.

This is not to discount the research which is our heritage from the 1930s and 1940s, nor does it deprecate the efforts of individuals who have extended this information since then (1,4,9,11,13,14,23,30). However, when one synthesizes what is known about motor development and compares it to the questions which remain unanswered, it becomes evident why elementary teachers feel frustrated in their attempts at curriculum construction.

2. Nursery and Prekindergarten Education. A recent United States government publication placed the population of three-, four-, and five-year-old children within the United States at approximately 12 million (6). Of these, one-third now attend a certified nursery or day care center. Estimates place the number attending such schools by 1975 at nearly 5 million.

At first appearance it would seem that the away-from-home environment would lead to numerous educational benefits. Early intervention in the home life provides the child with an opportunity to play with children of his own age group, to develop independence from family members, and to gain exposure to numerous situations not usually provided in the home. However, my brief encounter with prekindergarten schools suggests that they may be simultaneously providing pre-academic enrichment *and motor deprivation.*

The physical setting for prekindergarten schools is often dictated by insufficient operating funds. Church buildings become a favorite refuge. While such facilities are adequate for such skills as cutting, pasting, and painting, they are seldom equipped with sufficient indoor or outdoor space and equipment which permit children to engage in gross motor activities. Such vigorous movements as kicking, throwing, jumping, climbing, and running are apt to be entirely unfeasible.

The prohibitive effect of facilities on the motor development of children in prekindergarten schools is generally compounded by a lack of qualified leadership to provide instruction in movement skills. Any attention to motor activity is likely to be channeled into teaching the child how to handle table utensils and to put on and remove articles of clothing. The specific nature of these skills and the tremendous amount of time required to gain mastery of them point to the urgency of early practice. If a child does not develop a broad repertoire of fundamental motor skills prior to first grade, he will probably not find the time to do so thereafter. The demands of the classroom consume large amounts of time which were formerly devoted to gross motor activities.

Lack of a movement repertoire during childhood can have serious ramifications, for it is through participation in locomotor skills that much of the social and emotional development of childhood is shaped.

The preliminary stages of all fundamental motor skills are commonly established prior to six years of age. It has also been determined that the progression from level to level in these patterns depends upon an ample opportunity for practice under guided instruction. To place a five-year-old boy under a feminizing influence for eight hours a day, the whole while being imprisoned by stained glass windows, is a deplorable educational setting. I am concerned about the *motor deprivation* which may be fostered by many of prekindergarten institutions.

3. Dissemination of Information Concerning Motor Development. The Biblical admonition of "hiding one's lamp under a bushel basket" might well apply to those responsible for the dissemination of knowledge in motor development. A review of the U.S. Office of Education materials which cite exemplary programs in preschool education, funded under Title I, reveals that only 5 of 18 programs mentioned gross motor development among their objectives (22). Local efforts in Head Start, Vista, and other similar programs are characterized by similar omissions. To be so thoroughly ignored in programs where motor development should receive top priority is an indictment of our inability to communicate.

Perhaps the major breakdown in attempts to disseminate information comes from the inability to organize the content of motor development into courses for college students. The fact that we cannot provide answers to many of the questions should not restrain us in this attempt. Conversely, this organization of content is the process through which any area of study must pass before a systematic extension of its knowledge is possible. The amalgamation of information, as exemplified by Wickstrom's recent book *Fundamental Motor Patterns* (32), makes it possible for scholars to identify material which is well documented as a result of scientific study, while exposing content based exclusively on testimony and empirical evidence. Most importantly, it identifies gaps in the knowledge structure and isolates such areas for investigation.

The absence of motor development courses in college physical education curricula indicates that we depend on other professions to provide this information to our students. Child development courses typically are devoted to cognitive and social growth. Little, if any, attention is given to the interrelationship of biological and motor development and its influence on the child's welfare. Institutions which prepare teachers must provide opportunities which lead to an understanding of motor development if prospective teachers are to transfer this knowledge and experience to schools. Likewise, if we expect other professions to be mindful of children's motor needs, we must become interdisciplinary in the publication of our research findings and articulate them to students within the framework of course offerings.

My opening remarks alluded to the possibility that the current popularity of elementary school physical education programs may be partly due to the use of perceptual-motor skills to enhance academic achievement. Physical educators are quite adept at capitalizing upon current educational trends. In the 1950s we became physical fitness experts; in the early 1960s we solved problems and explored through the use of movement; now we are helping classroom teachers evoke appropriate academic achievement. Each of these ventures has added content to the curricula and the last two have contributed to methodology. Lamentably, from a personal viewpoint, our knowledge of motor development does not seem to have advanced as a result of these additions and recent encounters with perceptual-motor skills may even have resulted in the defection of a few of our most promising scientists.

The following concerns arise as the result of the union between perceptual-motor and physical education programs.

4. Objectives and Content. Perceptual-motor programs are characterized by variability in content and methodologies employed to change behavior (2,5,10,16,19,20). In this regard, they resemble the physical education programs with which I am familiar. The commonality underlying perceptual-motor programs is the use of activity as an adjunct to the attainment of academic goals (27).

Although some perceptual-motor programs have identified the theory, rationale, and sequential progression of their content, there is still considerable confusion in the minds of many in this regard. The following steps are suggested as an aid to understand the nature of perceptual-motor programs:

(1) Proponents of the various programs should enumerate their objectives in *specific behavioral terms.*
(2) The theories and rationale upon which the programs are based should be readily available to the educational community.
(3) The assessment procedures for the identification of children with gross motor and perceptual problems should be outlined.
(4) Rigorous scientific control should be exercised in evaluating the effectiveness of such programs.

5. "A Little Knowledge. . ." The multidisciplinary approach to the solution of perceptual-motor problems enjoys current popularity, and for good reason. Who would question a decision arrived at jointly by a pediatrician, psychologist, school nurse, and teachers of reading, speech, and physical education? However, that which is ideal and that which is practical in the team approach may vary from school to school, and it is probable that in many instances the classroom teacher and the physical education instructor comprise the professional contingent charged with the responsibility of dealing with learning problems. Thus, under the pressure of the parents and principal to "help the child," they arm themselves with the latest book on perceptual-motor skills and proceed to make the diagnosis, write the prescription, and administer the treatment.

Many activities included in perceptual-motor programs have been part of the content in good physical education programs for decades. Newer concepts such as laterality, directionality, position in space, body awareness, and the activities used to enhance them are well within the instructional capabilities of physical education teachers. However, my concern for the qualifications of persons who supervise children in perceptual-motor activities is aroused by the use of a markedly different group of activities. This concern was underscored recently when I was asked to review portions of three books which had been submitted for publication. Each was written for classroom and physical education teachers; yet all devoted a substantial volume of their content to drills dealing primarily with auditory, verbal, and visual perception. Each author recommended use of the materials for all children, and one advocated that complete mastery of the activities would prevent learning disorders.

It should be apparent to all educators that caution must be exercised in dealing with the assessment procedures, treatments, and teaching techniques of other professions. Printed materials written in a "do-it-yourself" style can encourage a false sense of proficiency, and the respective specialities must guard against such practices by pointing out the inherent dangers involved.

6. "Who Shall Receive Instruction in Developmental Movement?" The allocation of time for elementary physical education varies from school to school. Regardless of the time available for instruction, it is insufficient for the attainment of program objectives. It seems certain that in the future there will be continued attempts to erode the time devoted to physical education because of the demands from other curricular areas. One of the programs most likely to compete for the time, space, and talent currently reserved for physical education is devoted to enhancing the perceptual-motor abilities of children with learning problems.

The cost of providing perceptual-motor activities to these children is exceedingly high. The teacher-pupil ratio must be lower than in normal classes and the rate of learning proceeds at a slower pace. The special teachning qualifications which are required may place a heavy burden on the physical education teacher. At times he may be forced to make a choice between meeting his regular classes for the allotted time and providing special classes for those with perceptual-motor problems. There is no easy decision in such a dilemma.

Ideally, each program should be supported to the extent that it can meet educationally sound objectives. It is the obligation of physical educators and perceptual-motor specialists to produce evidence regarding the effectiveness of their programs through scientifically controlled experiments. Rigorous scrutiny of program results must become the basis for determining the amount of exposure which students have to programs.

I have attempted to identify certain shortcomings in our present knowledge of motor development. The effect of this lack of knowledge on programs for young children has generally resulted in a complete aversion to teaching developmental movements that require total body involvement.

In contrast to the problems involved in initiating programs for teaching fundamental movement skills, perceptual-motor programs seem to have gained wide acceptance, presumably on the basis of their alleged ability to alleviate learning disorders. While support for perceptual-motor programs appears to be considerable, there is currently little scientific evidence of their ability to affect positively academic achievement (8, 12, 15, 18, 21, 24, 25, 26, 28, 29).

Combined efforts of physical educators and perceptual-motor specialists to expand existing knowledge await the establishment of a scientific base of operation.

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CONCERNS OF THE OPTOMETRIST FOR MOTOR DEVELOPMENT

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Who is the modern, informed optometrist? He is a clinician, carefully and thoroughly trained in the anatomy, neurology, pathology, and physiology of the eye and its immediate appendages. But far beyond this, the informed optometrist is a clinician fully aware that the eye is little more than the end organ which receives and responds to light and translates light waves into electrical potentials which are sent into the spongework of the brain. The eye is not a camera – Helmholtz in 1840 lamented that there were no upside down pictures to the brain, only electric pulses. In the brain these electrical pulses are contrasted, matched, modulated, and integrated with signals arriving from other information systems in the human being. Further, the informed optometrist has spent the past 30-plus years realizing and studying the fact that (1) what a person *sees* is so much more, or so much less, than what the eye receives, and (2) that as optometrists, we have had to inspect, explore, and observe much more than the eyes and their appendages.

These realizations have been brought about primarily by clinical evidence of individual differences and likenesses in patients. For an example, two patients each have a pair of eyes which measure exactly the same in every clinical detail. These two pairs of eyes may show exactly the same degree of "refractive error" (the amount of nearsightedness) and need exactly the same prescription, and yet perform so differently that there could never be a real comparison between them. One of these patients may be unable to find the floor in the morning without first putting on his glasses, while the other patient may wear his glasses only under specific demands for accuracy and speed of seeing. From this clinical research has emerged the modern optometrist, who has had to give his attention to the performance of the seeing mechanisms in a total living, operational human being, rather than focusing his attention upon the end-organ itself as if its structure would fully determine its function.

We need to clarify the terms *sight* and *vision;* they are not synonymous. *Sight* is the response of the eye to light, and its translation of this light into neural signals. *Vision* is the response of the total organism–the entire human being–to the information being collected throughout the total organism as a result of the light impact. Sight is the reception of light. Vision is the translation, utilization, and integration of the information, followed by the action of the totality in its use of this information. Whereas sight refers to the reaction of the eyes to light, vision refers to the entire complex of responses in all of the information systems as a result of the *light impact.* These primarily include the information systems of kinesthesis, touch, hearing, and several others. Sight can be isolated in the eyeball; vision cannot and must interchange with other systems.

What optometrists call *vision* is so highly dependent upon what physical educators call *motor development* that we are, in effect, almost talking about the same thing. The major point here is the tremendous physiological difference between sight and vision.

(Parenthetically I wish to digress briefly to vent my personal emotions over the word *motor.* This is a very confusiong word because it implies to many persons something that is easily turned off and on–that it somehow contains a power factor related to strength, muscle bulk, and physical fitness. If the motor is sound, the action should be automatically sound. I like to think we are talking about *movement* development–movement as something under the full appraisal and control of the person, regardless of mere strength. But this is a subject for another time when our attention is on the sequences and organizational processes of child development.)

Let me tell you why the informed optometrist is concerned with motor development. I fully believe, and am fully confident that I could, if necessary, prove that vision cannot develop its ultimate skill of performance without movement development, and vice versa. Moreover, these two systems are so inextricably interwoven that neither can operate effectively without the other. More significantly, vision, as the guidance system for movement, and moment as the action system for vision, are what makes the human unique from all other animals in the development and use of perception as the genesis of intelligence.

Let me briefly tell of our first clinical experiences some 25 to 30 years ago which led us optometrists into the study of movement and its development in the human infant. When we realized there were functional differences between the two patients mentioned in my opening paragraph, we had to look for reasons beyond the eyes themselves. We learned that the patient who had visual abilities far better than the measurements of his eyes had indicated, was also the patient who had movement skills superior to the other patient. It was not difficult to conclude, and then clinically prove, that the patient who knew his surroundings better because of his movement experiences *in and through* his surroundings, was the patient with the greater visual development.

We immediately turned then to very young children, and found we could assist them in their visual development by programming and encouraging movement development. We then went back into the vision training rooms, moved patients needing the most clinical assistance into visually steered and appraised movement programs, and found them quickly and permanently learning visual skills and abilities they had not previously achieved in many of our elaborate instrumentations. Patients learned more depth perception by visually directing themselves as they moved through space than they did by looking at three-dimensional pictures and drawings, wherein the two eyes were supposedly picking up slightly different pictures. One-eyed people have excellent depth perception which they learn through movement, just as the baby does.

In this process of showing patients how to use movement for developing visual-spatial judgments, optometrists incurred some disfavor with physical education teachers, who thought that their field was being invaded. Actually, the optometrists were using movement to develop vision. Typically, some patients became more graceful and better coordinated in the process, but this was a side effect, not the goal. It occurred because optometrists discovered how to use their visual system as a more reliable guidance system—not just because they gained muscle organization.

(I must make another parenthetical remark about the relationships between "visual tracking, and reading skills" and tracking. Keep in mind the differentiation between sight and vision. Ocular tracking is mere eye movement following a moving target. It is interesting that both educators and optometrists find such poor ocular tracking abilities among the majority of those who are also poor at reading. Many good readers, however, also demonstrate poor ocular tracking. We in optometry have been saying for a long time there is no cause/effect relationship. They are both symptoms of the child's problem in getting all of his movement mechanisms to operate effectively and indicate his need for total movement skills.)

Visual tracking is the total ability to move the eyes across printed words in the proper direction and at the proper speed, scanning a word, phrase, or even a paragraph to glean as quickly, correctly, and effectively as possible the information they contain. Let us not confuse ocular and visual just because both involve and include the eyes; they are not the same level of performance.)

The more deeply we optometrists have probed and concerned ourselves with movement development in patients, the more we have begun to realize how significant movement is to visual development. Both education and optometry have taken eye-hand coordination pretty much for granted. We have assumed that this highly complex action is adequately present in all persons as long as they have two eyes which point where they should and two hands which have all 10 fingers. The more we have learned about perception, the more we realize that most perceptual skills are an ultimate result of how well the human being *visually* steers and appraises his movements through space, and how well he tactually *and* visually explores the contents of space.

Almost every investigator of the development of vision in children has concluded that the skill of making visual interpretations must occur first at near point where another information system (usually touch) can elaborate, verify, or mediate the visual estimate. It has to start at near point because the tongue and arms are only so long.

Consider texture and all of the facets of perception influenced by our appreciation of texture. Think about the texture of the wall decorations surrounding you without moving from your seat. You take a look and immediately say they appear rough, or velvety, or silky. How are you able to make this judgment? Was there a time when you rubbed your eyeballs across the surface of these drapes or some like them? Of course not! There was a time, though, when you fingered and explored similar textures with your tongue, lips, cheeks, and extensively with your fingertips.

Let me emphasize the importance of movement. Press your finger on the material of the clothing you are wearing and do not move it. Can you tell something of the texture? Now move it gently, or quickly. What can you now tell about the texture? Soon you can do this without touching because the visual information you get on the textured surface. You now are able to judge textural information across distances just by visual inspection, even though at one time you could do this only at near point.

Size and shape are perceptual factors of such great importance that all tests of intelligence and learning ability contain questions about them. Can you imagine achieving the ability to make visual judgments of the important characteristics of all objects in the world without the use of hands and movement? Lay a pencil, pen, or coin across the palm of your hand and think about it. Now, roll it and manipulate it with your fingers, and think about it.

How can you tell someone that something looks heavy or light unless there has been a background of experience wherein heavy and light objects were moved about by you as well as by the person to whom you are conveying this information?

We have now touched upon an aspect of vision and movement that is of great significance. The process of communication between persons–whether it concern the size, shape, texture, weight, or other aspects of perception–depends greatly upon the magnitude of the visual and movement development of both parties. If I wish to communicate with you, I had better use words and phrases that rouse visualizations and kinesthetic awareness of something you and I have both experienced–like volleyball, or swimming, or driving a car. If I do not wish to communicate with you, all I have to do is to start talking to you about the ways I use an "episcatistor," and how I run a set of "rotary prisms" to take a series of "duction findings."

We optometrists are concerned that those in physical education, health, and recreation are just as aware of *vision* (not just *sight*) and its significance to the child, as we are of movement and its significance to the child.

I hope we can find a common language that will allow us to make our unique and important contributions to the thousands of children who have developmental difficulties. I hope physical educators can see how influential they can be in the guidance and development of vision. What you do in the primary years can prevent more visual problems and distortions than can all the optometrists in practice. I hope you will realize that you can do more to prepare children for the academic demands now being placed upon them than can any other group of professionals available to children.

We in optometry have a growing concern for what we can contribute to the movement development of children by assisting them to find and use their visual system as the most reliable and effective guidance system for all movement–movement of self through space–and the manipulative movements so essential to the exploration and investigations of all the contents of space. Both optometry and physical education are primarily concerned with all the skills and refinements of visually guided movement available to the child. Movement for movement's sake is recess or gymnastics. *Visually guided and appraised movement* is the seed bed for intelligence. No organismic information system can become either inherently or developmentally sophisticate of and by itself. It must rely upon its genetically coded relationships with all other information and *action* systems for its elaboration and integration into an organismic totality. The highly complex process of interpreting the lighted environment through the light receiving mechanism depends more upon contact with, and active exploration of, this environment than upon any sort of retinal image. Movement then becomes the prime prerequisite for all the visual skills that must be achieved by the child for successful performance in the classroom's increasing visual demands.

It is neither the size of the muscle nor the size and shape of the eyeball that count, but rather the operational skill and efficiency of action that pay off in the development of the total organism. I hope we in optometry can assist you in becoming much more analytical of media and methods.

There are no bad materials, only poor use of materials. There are no panaceas or magic in any method or material. The magic is in the child. Most of all, movement must be for a purpose and this must be visually directed, appraised, and corrected movement.

As Whitehead aptly stated: "Civilization advances by extending the number of important operations we can perform without thinking about them." When the visual system and the movement system perform as a unity in the number of operations children perform without thinking about them, the children will have reached a level of effectiveness that we will recognize as a superior generation of children.

PERCEPTUAL-MOTOR DEVELOPMENT OF HANDICAPPED CHILDREN – THOUGHTS, OBSERVATIONS, AND QUESTIONS

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At the outset, two basic questions must be asked:

1. What is perceptual-motor development?
2. Who are handicapped children?

Each of us is absolutely certain he knows precisely what perceptual-motor development means. When we are pinned down to a *specific* definition, however, we are not so certain. Adding to the confusion is the problem of semantics and terminology. Individuals use different terms and interpretations when referring to the same characteristics. Others use the same terms and interpretations when referring to entirely different characteristics. Also complicating this situation is failure to differentiate among perceptual-motor characteristics and teaching procedures.

The need is obvious for consistency in terminology and usage, especially when personnel from different disciplines are involved. Clouding the picture further is a tendency to be over sophisticated and complex in the use of words. Frequently, a tried and true word–one that is simple and conveys exactly what is meant–is avoided so that new words can be introduced. For some reason this gives academic sanction and intellectual respectability to the educational jargon.

What is Perceptual-Motor Development?

Some things are certain regarding perceptual-motor development:

(1) It involves many things and is not a single entity. Unfortunately, we try to look upon perceptual-motor development as a single characteristic or ability; seek a magic test or evaluative instrument to tell the exact causes for every individual's academic problems; and strive for one program or approach that will be everything to everybody. How, in the last third of the twentieth century, with so much knowledge and sophistication, is it possible to be so naive?

(2) It is a way to attach significance to immediate environmental situations as one learns about himself, what he can do, how he can do it, and applies his knowledge and experience to the objects in his immediate environment. He learns relationships about himself and his environment. Perceptual-motor development by its very nature connotes action and activity; it is not passive–it involves more than simply pouring information into an individual.

(3) It is a way by which each individual organizes information about his past experiences in ways that can be applied meaningfully to himself. Organizing stimuli–sensory input, past experience–motor output–the integration of past experiences with new situations to form meaningful activity for desired outcomes, are all part of this process.

(4) It is a process whereby sensory information and cues are integrated as the individual performs meaningful tasks. The individual organizes what is sensed and felt into meaningful arrangements to that already organized–or disorganized–system that is the individual himself.

(5) It is exploration as the individual familiarizes himself with his world: he tries new experiments, speads his wings, and builds his own rocket to the moon; he registers with something out there, the real thing is his own world.

(6) It is problem solving as the individual comes to grips with his environment. He discerns incoming information from the senses which mediate the organization of movement.

(7) It makes things looks the way they do to each individual. Were you shocked the first time you heard yourself on tape? What would seeing yourself in a broken mirror do to your perceptions of yourself?

Perceptual-motor development means different things to different people. Despite its broad nature, perceptual-motor development deals with highly specific functions and is very individual in nature.

Who Are Handicapped Children?

Is Tom Dempsey, stellar young place kicker of the National Football League's New Orleans Saints, handicapped? Was Pete Gray, former one-armed major league outfielder, handicapped? Pete Dawkins, the only cadet ever to be captain of the football team, commandant of the corps at West Point, and president of the student council? Bobby Morrow and Wilma Rudolph, both triple gold medal winners in the Olympic Games? To many people each of these great athletes was handicapped–each was categorically labeled because he was afflicted with one condition or another–congenital birth defects, amputation, cerebral palsy, or severe childhood illness. Many individuals who are labeled handicapped on the basis of an impairment do not consider themselves handicapped. It is time we began to differentiate among the terms *impairment, disability,* and *handicap.* Each of these terms should elicit a specific connotation and be used in the appropriate context.

Impairment refers to an identifiable condition–orgranic or functional. This is a condition in which the individual actually is missing some part of the body (a portion of an anatomical structure) or one or more parts of the body do not function properly or adequately. Tom Dempsey has only a portion of his kicking foot; Pete Gray did not have a right arm. These are identifiable conditions–impairments in every sense of the word, but they may or may not be disabling or handicapping.

Disability refers to ways in which an impairment affects an individual's ability to perform. Tom Dempsey's partial foot may have made him a better place kicker than individuals with both feet completely intact; Pete Gray reached the epitome of success in his chosen profession with only one arm–he played centerfield on a major league baseball team. These specific conditions–impairments involving parts of the body directly used in performing these acts–apparently were not disabling to these two men; other individuals with the same conditions may have been severely disabled in these activities as well as in others which require considerably less use of the feet or arms.

Handicap refers to ways in which an individual lets an impairment affect him psychologically and emotionally. Many persons with impairments are handicapped. However, many other persons with severe impairments adjust extremely well to their conditions and live happy and productive lives–in their eyes they are not handicapped, even though society labels them as handicapped. Undoubtedly, many persons in society with neither impairment nor disability are handicapped!

Thoughts, Observations, and Questions

Often we are guilty of *hardening of the categories!* We delight in making broad generalizations, convincing ourselves that we know exactly what to expect of youngsters, and determining what individuals can and cannot do on the basis of labels and categories, even when their conditions may not be relevant to the activities, skills, and patterns being considered. This is implicit in our concern about perceptual-motor development for handicapped children–we generalize or imply that all individuals with impairments, disabilities, and handicaps must also have perceptual-motor deficiencies. Such a generalization is as untrue as the old saw that all children with reading problems have perceptual-motor problems! Such conclusions do not take into consideration the perceptual-motor process itself or the process by which children in general, and the impaired, disabled, and handicapped in particular, grow and mature.

Perceptual-motor development describes an orderly *process* which involves:

(1) Receiving and transmitting input information via various internal and external sensory pathways–vision, touch, kinesthetic, smell, taste, hearing, proprioceptive, balance.

(2) Collecting, indexing, storing, and making information available for future use.

(3) Matching and/or referring new information to information which has been previously collected, indexed, and stored.

(4) Translating information into activity through movement.

(5) Children learn through direct involvement as they participate in this process. When the process focuses on itself, and emphasizes concepts rather than specific skills–motor as well as academic–the learner will more likely be able to transfer these concepts in solving new problems. As we view this process, several important questions are raised relative to perceptual-motor development of impaired, disabled, and handicapped children. How does the perceptual-motor process differ among the impaired, disabled, and handicapped and those without any of these conditions? How does the process differ among children with different conditions? Should the primary concern in these programs be the perceptual-motor process or specific impairments?

Basically, the perceptual-motor process does not differ between the impaired and those without such conditions; it does not differ among children with different conditions. However, we must be concerned with ways in which an individual's impairment, disability, or handicap affects his ability to function in specific situations and at various levels in the perceptual-motor process. We must be prepared to adjust certain procedures to meet the needs of each child. These decisions must be made in terms of how each individual condition affects the individual and the perceptual-motor process. The following are important considerations.

(1) Individuals with specific sensory defects–blindness, partial sight, deafness, partial hearing–are primarily affected at the input or sensory level; they have difficulty in receiving and transmitting stimuli via the sensory pathways.

(2) The mentally retarded are primarily affected at levels in which information is collected, indexed, stored, and made available for use through interpretation and integration; they have difficulty with the associated mental aspects in the total process.

(3) Physically handicapped individuals are affected primarily at the output level, where information is translated into motor activity; they have difficulty in executing specific actions.

(4) Children with neurological conditions, brain injuries, and cerebral dysfunction can be affected at different levels in the process, depending upon the sections of the brain and nervous system which are affected. An emotionally disturbed child can be affected at any stage or level.

(5) Some individuals may have problems at several levels; these multiple conditions are more severe and difficult to remedy.

To meet each individual's needs on the basis of his specific problems requires a diagnostic approach built upon relevant cause and effect relationships. This approach recognizes that there are many causes for the same behavioral traits and deficiencies. It is our job to find the specific causes of these problems in each child. This approach in itself precludes broad generalizations.

To be successful in this type of program, teachers must be well imbued with developmental sequences and activity progressions, have a realistic understanding of child growth and development–including an appreciation of various impairments, disabilities, and handicaps–and possess the ability to adapt and modify according to individual needs and problems. They must be flexible, willing to try the untried, and have no fears of breaking with tradition to individualize programs to meet each youngster's needs. Only with this approach can we truly say that programs are being developed and implemented according to the needs of individual children.

This discussion of the perceptual-motor development of impaired, disabled, and handicapped children emphasizes several factors:

(1) Perceptual-motor programs should be developed in terms of each individual's abilities and limitations. Youngsters with perceptual-motor difficulties should be placed in activities on the basis of this criterion, not whether they happen to be afflicted with an impairment which may have no effect on the perceptual-motor function. Specific impairments do affect methods and approaches, but this consideration is to the primary concern–perceptual-motor function.

This means that program placement can be more uniformly applied for all students. Remedial programs and special placement are determined through application of the same criteria–and these focus upon the perceptual-motor process and function of *all* children. Similarities among all children, rather than differences, are emphasized and reinforced.

(2) The specific nature of perceptual-motor function, and the many ways in which youngsters develop these traits are apparent. Our concern needs to be upon individuals with various perceptual-motor difficulties, emphasizing the individuality of the causes for these deficiencies. However, use of similar approaches at earlier ages and stages cannot be overlooked as extremely important in preventing perceptual-motor deficiencies in particular, and other problems in general, at later ages and stages. It seems perfectly logical to introduce activities and procedures earlier as a preventative and as part of a developmental program when these same activities and procedures have been used in remedial programs.

(3) Physical education classes can be used to reinforce many perceptual-motor concepts introduced in the classroom. In some instances, physical education teachers have been very successful in introducing some of these concepts in the gymnasium and on the playing field. However, we must not be pressured into equating perceptual-motor programs with comprehensive physical education programs. This can be no more justified than the programs which placed their entire emphasis on fitness during the late 1950s and early 1960s.

(4) Despite the many contributions that perceptual-motor programs make, we cannot overlook the possibility that the major contributions may be psychological and emotional.

In evaluating the activities and methods of perceptual-motor programs, we immediately recognize activities and methods, that have long been a part of early childhood programs, particularly on the pre-school, kindergarten, and primary school levels in particular. Only in the last few years, however, have large numbers of perceptual-motor problems been identified.

Paradoxically, many of the children with perceptual-motor problems are of a generation of which we can ask, "What happened to their childhood?" How many of these youngsters had opportunities to play, explore, and participate actively in the basics of the perceptual-motor process? How many of them have had opportunities to progress through the natural and normal developmental stages?

No matter how rapid our daily life and activities, the process of maturation and development cannot be rushed; it must go through usual stages, taking its own time. When this process is abnormally hurried, there are devastating results encompassing psychological, emotional, social, and even physical factors. Need we look further than the problems of society today–drugs, dropouts, suicides among high school and college students, and psychosomatic ulcers among elementary school children.

How many youngsters have perceptual-motor problems which can be attributed in toto, or in part, to opportunities they didn't have? How many youngsters literally skipped childhood with few, if any of the usual fun experiences? Of the children who were deprived of such opportunities, how many of them exhibited other kinds of deprivation at a later age?

In these days of early childhood education programs for all children, especially programs to identify and help children with potential educational problems, haste must be made with extreme care and caution. Many early childhood education programs thrust children into academically oriented programs and activities at the expense of normal, natural experiences in play. Making this trend even more alarming is the fact that these things are happening during developmental stages and growth levels when the potential detrimental effects are the greatest. That knowledge, information, and facts about child growth and development needs, patterns, and sequences are being ignored is perplexing. If these trends continue, we could be creating a generation of children whose future psychological, emotional, and academic problems will make those of the past seem like child's play!

The very characteristics and behavioral manifestations which the early childhood education programs are designed to minimize or eliminate may, in fact, be emphasized and made worse. We cannot be pressured by well meaning, but often misinformed or uninformed, legislators who have projects which on the surface seem logical and necessary, but in reality contradict everything known to be good for children.

We must counter these frightening trends, such as compulsory academic education for three-year-olds. It's high time–in fact, long past time–that professionals who are involved in programs for children be heard. Guidance based on the experience, dedication, and judgment of teachers who deal with children day-in and day-out is sorely needed. It's time for concerted action *now*–tomorrow may be too late!

NATURE AND EXTENT OF PROFESSIONAL PREPARATION EXPERIENCES IN PERCEPTUAL-MOTOR DEVELOPMENT

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The increasing number of perceptual-motor programs in public schools directs our attention to the professional preparation of physical educators destined for involvement in these programs. As the coordinating agency for perceptual-motor information, the Perceptual-Motor Task Force assumed responsibility for ascertaining the status of special preparation in this area.

Through the cooperative leadership of the state liaison members of the Task Force, a very general survey was made of colleges and universities offering physical education courses in the professional preparation of undergraduate and graduate students:[1] The following question was asked: What educational experiences are you providing in perceptual-motor development in the professional preparation of physical educators?

Respondents were requested to furnish information as follows: (1) name of institution; (2) course title; (3) description (conceptual emphases); (4) practical experiences associated with course; (5) required or elective option; and (6) level–undergraduate or graduate.

Reports were submitted by 22 state liaison members. Of these 4 states indicated that present course offerings did not include special emphasis on perceptual-motor development. The remaining 18 states, which represented 138 institutions, included information about a variety of curricular offerings.

The purpose of this paper is to report the results of this survey and then to discuss what should be considered as the parameters of perceptual-motor development preparation for physical educators.

The range of educational experiences cited in this study was exceedingly broad. They ranged from the traditional elementary physical education course with one or two lectures devoted to perceptual-motor behavior, to graduate in-depth specialization. The varied ideas of what constitutes the study of perceptual-motor development in physical education courses are reflected in the broad spectrum of emphases identified by respondents. These emphases or major conceptual areas cluster as follows:

1. Diagnosis and treatment of the atypical or exceptional child
2. Principles and theories of learning underlying motor performance
3. Developmental factors in motor performance

In addition, the same conceptual areas studied at the graduate level frequently are offered at the undergraduate level. There is no particular pattern regarding whether or not a course is required or elective at either level of study.

The observations and comments made by some liaison members are as follows:

1. Few institutions are offering entire courses in perceptual-motor development and/or learning.
2. The real interest and need for study in this area is generated by teachers from the K-6 grades.
3. Courses in the study of the atypical child are often taught separately by the physical education department and by the education department instead of offering a multidisciplinary approach.
4. An insufficient number of course offerings prevents students from selecting study in this area as a concentration.

To these factors, the following questions are added for consideration:

1. What *should* be the parameters of study in perceptual-motor development?
2. Should there be a separation of the concepts of perceptual-motor development and concepts of motor learning?
3. Should professional preparation in this area focus solely on learning to cope with children in learning disability programs?

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[1] See page 134, in Section IV, "A Survey of Professional Preparation in Perceptual-motor Development," 1970.

Now let us discuss what the parameters of the study of perceptual-motor development should be by highlighting events from the last three years.

In 1967, confusion existed among many people involved in school perceptual-motor action programs. The vast majority of these physical educators found themselves thrust hurriedly into existing, or soon to be initiated, programs designed to help children with "perceptual handicaps." The perceptual handicaps were reflected in the children's inability to read at their grade level. Soon, various theoretical systems were espoused which were intended to guide children through an educational program which would help them overcome their difficulties.

Most of the physical educators involved were without special preparation in the diagnosis and treatment of learning disabilities. If responsible for program design, most of these teachers chose a particular system and proceeded according to their best understanding of it. Workshops abounded in "this system" or "that system." Most of these sessions provided a telescoped version of neurological organization, a brief explanation of the theory behind the educational system and its relation to developmental stages and learning theory, and a detailed description of the treatment procedures (exercises, experiences) to be used for children with learning disabilities.

As federal funds increased for school districts, more money could be allotted to financing perceptual-motor workshops, knowledge gained at the workshops resulted in the institution of more perceptual-motor programs, and as a corollary, more children than ever were identified as having perceptual problems.

The Perceptual Motor Task Force took the philosophical position that the greatest need was the provision of scientific foundation information relative to the developmental processes, with specific emphasis on perceptual factors. Hence, our continued thrust has been perceptual-motor development. In some respects, however, the pressure on physical educators to guide the gross motor portions of the perceptual-motor programs in the schools has retained the emphasis on learning techniques to use with these youngsters.

The present situation might be compared to the physical fitness decade when we indoctrinated our students with knowledge of the tests, but did not always accompany this knowledge with the scientific concepts which would make the students intelligent consumers and/or critics of these tests. What percentage of teachers in the perceptual-motor action programs are equipped with the scientific foundations necessary for competent evaluation of the techniques and tests they have selected or designed for use with perceptually handicapped children?

Two major assumptions should be made at this point: (1) the perceptual process in the maturing or the matured individual is an integral function in the success of learning a motor act (or skill) and its subsequent performance; and (2) physical educators have an important responsibility to design and conduct gross motor activity programs for children who have a broad range of learning deficits. At first glance these two assumptions may appear unrelated, but they are not. The first assumption stresses that all children under the guidance of physical educators can benefit from our increased knowledge of the perceptual process. The second assumption suggests that physical educators must be appropriately prepared to understand the perceptual process in learning and its special implications for teaching atypical children. Hopefully, these assumptions will delineate more clearly our responsibilities in providing adequate study of perceptual-motor behavior.

With this background of events, what clues have evolved to guide us in establishing parameters for the study of perceptual-motor development? In our Task Force Symposium of 1968, a panel drawn from several disciplines addressed itself to this question. One physical education panelist stated, "Our conversation has been totally in the direction of trying to improve the child's perceptual performance, which is fine. My particular concern, however, is to improve his motor performance." This view is embraced by most physical educators.

The perceptual psychologist on the panel informed us that neurophysiologists and neuroanatomists historically referred to the term perceptual-motor as *two* systems–the motor system and the sensory system. He continued by saying that, in actuality, there is no justification for thinking of these as *separate* systems because, "... you probably cannot get motor activity without the perceptual. We ought to think of them (the motor system and the sensory system) as one system..." (1) In striving for a definition of perceptual-motor development, Professor Cohen, the perceptual panelist, offered the following:

> **All those functions of the body that have a voluntary component and, of course, depend on some kind of sensory feedback and some kind of sensory perception prior to the motor act would fall into this category. It would be hard to think of a motor act that does not require either prior perceptual awareness of some kind of stimulation in the environment or at least require some kind of sensory feedback during execution of a motion (1).**

To Cohen's definition of perception we might add the word *development* which is conceived as an "increase in skill and complexity of function" (2). Cohen further expanded the concept of development by suggesting the inclusion of *training*.

To summarize, the phenomenon of perceptual-motor development is concerned with the sequence of development of the sensoria (the sensory end organs, the afferent nervous system, and the sensory cortex) and their role in the process of perceiving which may be reflected in the quality of the observed motor performance. Consider, for example, the question, "What is the perceptual-motor development of the five-year old?" If replying in the context of the foregoing definition, one would present an analysis of the stage of development of each of the sensory or perceptual modes that may be involved in eliciting a specified motor act, e.g., vision, proprioception, balance mechanism, etc.

What implications can we draw from this definition for study by the undergraduate and graduate student in physical education? It is essential that all physical educators, regardless of intended vocational direction, fully understand the neurological organization underlying learning, the anatomical and neural aspects of the sense organs pertinent to movement and their stages of development, and the role of perceptual organization in movement behavior. This information falls within the category of scientific foundations of the perceptual process as alluded to earlier. Or, one might classify it as conceptual information basic to understanding the process of learning which concludes with an observable product, such as a tennis forehand drive. It is inconceivable that an undergraduate curriculum would not contain all of these major conceptual areas of study, and yet there are few undergraduate curricula which provide this kind of information.

Cohen's idea of training as a function in development serves to incorporate the remaining major conceptual areas of study in what is frequently labeled motor learning. Included are the affectors such as level of aspiration, fatigue, role perception, and others which may influence the learning process. Also included are the conceptual areas which determine conditions of the learning environment, such as practice, specific teaching techniques, and learning aids.

Knowledge of this conceptual information alone is not sufficient unless one is competent in evaluating the effectiveness of any specific learning situation. Teachers need a familiarity with procedures and/or assessment tools which yield specific information about the processing of information during the sensory input phase of learning, as well as knowledge of valid and reliable tools used to assess the quality of motor output.

To summarize, professional preparation in perceptual-motor development should:

1. Be required of all students preparing to assume the role of teacher or researcher.
2. Include the major conceptual areas required in understanding the processing of sensory information during the act of learning.
3. Include the major concepts in learning categorized as affectors, and which are unique to each individual.
4. Include the conceptual areas which would help the teacher to structure a most effective environment.
5. Examine assessment tools and their appropriate uses in evaluating the phases of a given learning situation.

Normally, preparation for the teaching role occurs at the undergraduate level. As a result, all of the major areas of conceptual information identified should be provided for study and accompanied by appropriate laboratory and field experiences at this time. The potential for additional depth courses in the four major conceptual areas identified is always present, but would depend upon the specialization of available faculty. Already some institutions have expanded beyond the traditional course organization—"Principles of Motor Learning," "Theories of Motor Learning," and "Seminar in Motor Learning".

Discussion of what should be the parameters of study in perceptual-motor development has obviated additional discussion of the second question raised, "Should there be a separation of the concepts of perceptual-motor development and concepts of motor learning?" Clearly, concepts of perceptual-motor development and concepts of motor learning should not be separated in the course of study. Let us turn now to the second assumption stated early in this paper.

We in physical education do have an important responsibility to involve ourselves in special programs for children with learning deficits. One can look today in almost any section of the country and find physical educators teaching gross motor activity to atypical or exceptional children. Generally, these situations are restricted to children whose motor performance is below par.

With a thorough understanding of the learning process, the interested student or teacher should experience no difficulty in pursuing study of the atypical child. It is widely accepted that understanding deviations from normal behavior presupposes one's understanding of normal behavior, whether it be personality or motor activity. Perhaps the real question in this specialized area of study is one of responsibility. Within whose purview should we study the atypical child and his characteristics?

It is not uncommon these days to find topics such as "characteristics of the neurologically impaired child" and the "retardate" included in various physical education courses. One might question the competence of the physical educator to teach conceptual information which more appropriately belongs within the framework of special education, developmental psychology, or a similar university division of subject matter. Likewise, we should question the competence of the special educator working alone to direct gross motor therapy laboratories; the multidisciplinary approach should be used in the teaching of integrated concepts.

Education of exceptional children has expanded in recent years from groups identified as mentally retarded, blind, deaf, and crippled to groups who are designated as having brain damage, neurological impairment, or minimal brain dysfunction. A medical orientation to the education of these children has gradually shifted to an approach which views the brain damaged child within a *behavioral* frame of reference. These children are often described as learners with a difference; they learn not poorly, but differently.

In attending to the needs of the various disabilities, specialists have evolved in each of the learning disability categories. Initially, this development lead to an emphasis on one aspect of therapy often to the exclusion of other areas which may be involved. For example, the optometrists's program relied heavily on visual-motor remediation and frequently ignored the critical influence of audition. More recently, the view of perceptual-motor processes as being influential in learning disabilities has received widespread attention by *all* learning specialists. Recognition commonalities among various disabilities has been facilitated by the recent development of general theoretical frames of reference within which all learning disabilities can be studied. Research data have confirmed many etiological and behavioral similarities.

The importance and use of movement of the body in some developing theoretical constructs, and the programs emanating from these constructs, have become particularly evident in the perceptual-motor training systems of Kephart, Getman, Barsch, and others, and also in the multisensory approach of Cruickshank. A thorough study of many of these theoretical models indicates heavy reliance on gross motor activity prescribed individually for children with varied learning disabilities. In many instances, there is little research evidence to indicate the validity of the gross motor experiences that are purported to enhance cognitive learning.

It should be the appropriately prepared physical education specialist who assumes responsibility for evaluating specific movement experiences to determine their potential for maximizing the performer's attention to the input from given sensory modes. For example, one theoretical systems approach includes the training of "general movement patterns." It is postulated that when the child moves, he learns; what it is he learns has yet to be identified.

Also included in the movement areas is a series of special movement patterns designed to enhance eye-hand coordination, the visual-tactual systems. Published critical reviews of this portion of the program strongly question even the basic premise that training a child to balance on a rail will improve perception and learning in general.

These remarks are not intended as criticism of learning disability theoreticians and clinicians, but rather as support for the continued use of physical educators as qualified program personnel in the movement area. In addition, it is hoped that many more perceptual-motor researchers in our field will turn their attention to the much needed validation of specific tasks and assessment techniques used in the movement portions of the various special education programs.

It is incumbent on us in professional preparation to interest qualified students in pursuing specialized study so to achieve competence in one or more roles in the movement subsets of special education models, whether it be planner, teacher, researcher, or all three. Every effort should be made to work cooperatively with representatives of cognate fields in our colleges and universities; these fields have a common purpose of providing qualified teachers to guide various programs for exceptional children in public education.

Multidisciplinary courses might result from this team approach to professional preparation. Of equal importance would be the opportunity for students to observe specialists from many disciplines working together to provide depth studies that result in effective methods for relieving learning disorders.

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A RESUMÉ
OF MOVEMENT AND MOVEMENT PATTERNS OF EARLY CHILDHOOD

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The purpose of this study was to discover and document the developing movement and movement patterns of children ages two to six. The data of the movement patterns of early childhood was obtained through analysis of motion pictures. The analysis was done by recording movements on charts which were an adaptation on the Kephart Movement Pattern Check Charts. The study was conducted over a period of three years under the sponsorship of the Richmond City Schools and the Virginia State Department of Education. Fifty-seven subjects were enrolled ranging in age from two to four and 60% completed all phases of the study (34). There were 22 boys and 35 girls in the study. Thirteen of the 57 subjects were blacks and 44 were whites.

Twenty-five gross motor tasks were selected as fundamental and basic to the performance of more complex motor actions. They included walking, running, jumping, climbing stairs and ladders, throwing, and striking. Each task was presented to a child as simply as possible with a minimum of instruction and demonstration. He was given an objective (as jump over the bar, skip to the tree) but not instructed how to perform. The subjects were filmed in motor tasks at six-month intervals. A scoring plan was devised based on success as well as on selected elements of performance. Motor scores were completed on a one to five scale for each task.

Special features of the research design included the study of the development of *elements* in the performance of each task, the identification and study of eight general characteristics of movement, and the identification of developing movement patterns. The eight characteristics of motor performance selected for special study were as follows:

1. Dominance (defined as side preference for paired parts)
2. Opposition and symmetry
3. Dynamic balance
4. Total body assembly (defined as using the parts of the body as levers (a) in sequence for speed (b) simultaneously for force or (c) in combination of (a) and (b) for explosive power release)
5. Rhythmic 2-part locomotion as in the gallop, slide and skip
6. Eye-hand efficiency
7. Agility (defined as maneuverability of the body)
8. Postural adjustment

The completed report presents the data on descriptive norms for the performance and movement patterns of each age-group as well as the details of the development of movement patterns for each of the 25 motor tasks.[1] Movement pattern was defined as "a coordinated movement of body parts used involuntarily to achieve a certain objective."

Descriptive norms were developed for each age level. For example, at age two the subjects in this study were successful in performing 16 of the 23 movement tasks assigned. The successful tasks included: ascending and descending stairs, bouncing a board, carrying, catching, climbing, creeping, doing a forward roll, galloping, hanging, kicking a ball, pulling, pushing, running, throwing, and walking. The subjects were especially proficient in carrying and creeping. The two-year-old subjects' attempts to hit a ball, walk a beam, execute a gallop, jump over a bar, skip, and slide and hop, were in most cases unsuccessful. Girls scored higher than boys in 15 of the 23 tasks but the difference in total motor scores was small. All two-year-olds demonstrated right hand preference in throwing and right foot preference in kicking but varied in the use of hand or foot occasionally (10 percent).

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[1] A Longitudinal Research Study Sponsored by Richmond City Schools and The State Department of Education, Richmond, Va., 1966-1970.

Two-year-olds displayed opposition in vigorous running but were inconsistent in their opposition to walking and kicking. Approximately half of the subjects used an "X-lateral" synchrony in creeping and climbing. A smaller number used a foot over foot pattern in ascending and descending stairs.

The two-year-old subjects were able to control their balance on the bounce board but not on the four-inch walking beam. The older two-year-olds could gallop with one foot leading and the choice of leading foot was evenly divided between left and right foot. They did not gallop with the other lead foot. They appeared unable to slide or skip effectively, but made an attempt.

The two-year-old children did not demonstrate effective total body assembly in throwing or hitting; however, they used it occasionally in a standing jump *down*. They were unable to achieve a two-foot takeoff except from a *raised* surface. They utilized their strength effectively in pushing (63 percent), and to a lesser degree in pulling and carrying.

The two-year-olds responded visually and manually in catching a large ball and were sometimes able to connect a mallet or bat with a stationary ball (46 percent). Their agility was low, as evidenced in the execution of the forward roll. The two-year-olds' body alignment was good and they adjusted their posture satisfactorily in walking, running, and jumping.

It is the opinion of the investigator that much of the value of this study lies in the finding of the *ways* in which a child moves rather than revelation of success or failure for a given task. Success for each task was recorded; more importantly, those elements deemed to be typical of *mature* (but untrained) performance were listed, recorded, and considered in scoring. Thus, by studying these elements for each individual, norms were obtained as well as details of the development of a *movement pattern* for each of the motor tasks.

For example, the movement pattern developed by the age of six is kicking a moving ball, at the age of two and three kicking a stationary ball and at the ages of four, five, and six rolling a ball. The elements of this task are as follows:

Moves toward the ball, contacts the ball with foot, times back swing for kick, uses limbs in opposition, uses right foot (or left), extends knee in kicking, contacts ball squarely, controls direction, moves in direction of kicked ball.

The task was successful when, from foot contact, the ball moved forward at least its full circumference. A more mature pattern required kicking from a backswing or in the stride of the run with opposition unless the ball was lifted and both arms moved forward-sideward for balance.

Success was achieved by all subjects except a few of the youngest two-year-olds. Direction was predominantly forward, but with much deviation to both left and right. Preliminary backswing was limited and inconsistent at ages two and three, but prevalent and vigorous at four and thereafter; at these ages when the ball was rolling, the subjects ran to meet it.

A consistent preference for the right foot was demonstrated at two and at later ages. Opposition of arm and kicking foot was irregular at all ages but with 67 percent frequency at age five. As the older child began to lift the ball, the arms tended to spread sideward. There was much variation in contact of foot with ball and, consequently, of direction. Knee and ankle were usually extended in the kick. Approximately half of the five- and six-year-olds moved forward in follow-through after contact.

Of the eight motor characteristics selected for special study, seven appear to be useful either singly or in combination as predictors of motor performance or movement development. Like-dominance was not significantly related to motor score at any age; however *right* like-dominance was so frequent in this study that it yielded little variant information. Of the other seven motor characteristics, dynamic balance, total body assembly, opposition, and symmetry revealed high positive correlations with motor score at all ages. All of the seven motor characteristics were significant at the five percent level of confidences as predictors of motor performance at one or more of the ages studied.

As in all studies of children, the subjects were found to differ within their own groups and in their performance as individuals from time to time. Age was found to be the most significant factor both from age-group to age-group and for rank by score within age groups. The 10 lowest and the 10 highest deviants in motor score were evenly divided as to sex, but the children of the black race were found more frequently among the high deviants and less frequently among the low. Although there was much individual variation and some variation between the age groups, the general characteristics which appeared to be demonstrated less often by the low deviants and more often by the high were: (1) eye-hand efficiency, (2) dynamic balance, (3) total body assembly, and (4) rhythmic locomotion. Low and high scores appeared to result from generalized proficiency rather than from extreme scores on one or two specific motor tasks.

Summary and Conclusions

1. If motivation and opportunity are provided, normal preschool children will perform a variety of movement tasks successfully and will use movement patterns which are similar and

which emerge and/or develop according to a predictable timetable.

a. Children do progress in their ability to move. Their progress is demonstrated by increases in the speed, force, and power which they are able to generate and by the developing complexity of their movement; they are able to cope with purpose and a variety of goals as indicated by the developing mastery of their own bodies and of the factors of time, force, and space.

This progress in movement appears to emanate in part from the growth and development of the neuromuscular system to a point of readiness, which manifests itself on a predictable timetable. In addition this progress or development in movement requires effort and practice in a favorable environment with goals that are appropriate and interesting to the child.

It was found that the subjects progressed with varying but definite steadiness in their ability to perform 25 movement tasks successfully.

b. Basic movement patterns are established in early childhood. Movement patterns were easily identified by the similarities with which children executed the movement tasks and by the preponderance of likenesses in performance over differences, especially among subjects of similar age.

These patterns were divided into three classes:

(1) Those complete or almost complete at age two
(2) Those which were incomplete but not totally absent at age two and which continued to develop after age two
(3) Those which emerged either in whole or in part after age two

2. Motor performance and movement development vary with age, sex, and individuals.

a. Movement development is positively related to increasing chronological age. The variation of motor score with age may be expected at all age levels but a difference of a few months is of less significance at four and after than at two and three. When children are classified in age groups, teachers and parents should be especially aware of age differences within the groups.

b. Movement prowess tends to be greater for girls at ages two and three and for boys from four to six.

c. Sex differences appear in several motor tasks, with girls having some advantage in jumping, rhythmic locomotion, and balance tasks, and boys in catching and in tasks requiring strength and speed. The greatest difference occurred in throwing and was manifested in the definite superiority of boys from age three.

d. There was much variation among preschool subjects in movement development. Wide deviations from the mean is attested by large standard deviations. Varying ranges of motor scores marked the performances of all age groups and many individuals.

e. Young children of the black race appeared to have some advantage over white children in motor performance. At each age group the correlation was below the established level of significance so the evidence here is inconclusive.

3. Two criteria appeared as effective for the evaluation of a young child's development in movement. These were: (1) his progress over a period of time and (2) his achievements and patterns as compared with those of other children his age.

a. Movement progress may be assessed. Appraisal in this study included: judging the success of a subject in specific movement tasks, recording the elements involved in the movement when the subject attempted the task, and reviewing this record for the absence or presence of selected movement characteristics, as well as evaluating these findings in terms of movement pattern and results achieved.

b. Norms can be established for movement development. As assessed in this study, movement development may be described for each age level. However, it must be noted that the performer and performance described are always hypothetical. The performance represents in most instances the mean performance of all the subjects at that age and it is probable that no child in the group conforms to the description. The described performance for each age represented a norm for the subjects of that age enrolled in the study and so used, may offer a criterion of value for all persons concerned with young children.

4. Seven characteristics have been identified which appear to be significant in the movement development of young children. They were dynamic balance, opposition and symmetry, total body assembly, rhythmic locomotion, eye-hand efficiency, agility, and postural adjustment.

5. Like-dominance was not significantly related to motor score at any age. This characteristic, usually *right* like-dominance, was so common in this study as to yield little variant information.

6. In statistical analysis it was found that the presence of a combination of the components of these seven characteristics would be valuable as a predictor of motor score or as a criterion of movement development.

Recommendations

1. The findings of this study should be utilized in developing curricula for preschool children, for teacher preparation, and in furthering the knowledge of physical educators, pediatricians, and others in related professions.

2. Physical educators should extend their programs to provide for the needs of preschool children. Movement as a factor in learning and in the development of readiness to learn needs further exploration. This exploration should focus on gross movement in early childhood.

3. Since this research has been limited in number of subjects, geographical area, and study conditions, it is the investigator's hope that other studies with similar or related purposes will be made of the movement of young children under differing conditions.

THE IDENTIFICATION, DIAGNOSIS, AND REMEDIATION OF SENSORIMOTOR DYSFUNCTION IN PRIMARY SCHOOL CHILDREN WITH IMPLICATIONS FOR PHYSICAL EDUCATION AT THE PRIMARY LEVEL

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The first part of this paper is concerned with some of the basic theories of Dr. A. Jean Ayres. Dr. Ayres is an associate professor of education, University of Southern California. She has a neurophysiological approach to perceptual-motor dysfunction. She has been working in this area for over 20 years and is nationally recognized for her contributions in the field.

The second part of the presentation will give a review of the Title III ESEA Project on "The Identification, Diagnosis, and Remediation of Sensorimotor Dysfunction in Primary School Children." This Project is under the direction of Mrs. Patricia Wilbarger, a registered occupational therapist who specializes in the study of perceptual-motor development and dysfunction. Dr. Ayres has provided the theoretical background, the diagnostic tests, and the basic implementation of theory for the Project.

The last section will present some ideas on the implications for physical education at the primary level.

Dr. Ayres' theories are founded on certain basic principles and assumptions. According to Dr. Ayres:

> A large part of our living consists of interacting with the environment. By environment is meant all the tangible, touchable objects in our lives, including the most important object, the earth. . . .To interact, two basic processes must occur: (1) we must know something about the environment and (2) we must be able to act on the environment. Knowing about the environment is dependent upon environmental stimulation of our sensory receptors and our attributing meaning to the resultant stimuli. . . .The major types of sensory receptors through which this information comes are visual, tactile, proprioceptive, and vestibular . . . . When we consider the senses through which we know our tangible environment, we find the same major senses, touch, proprioception, vestibular functions, and vision.
>
> Our task then, to oversimplify it, is to understand the nature of these four sensory modalities, how the ability to interpret these types of sensations develops, to discover the principles which underlie their use in interpreting and acting on the environment, and most of all to investigate and understand the nature of the central nervous system mechanisms which integrate sensorimotor function . . . . In addition, it is hypothesized, the central nervous system mechanisms on which perception is dependent are directly, as opposed to indirectly, critical to such cognitive skills as reading, writing, and development of numerical concepts (1).

Dr. Ayres has also presented a theory about the nature of perception and its development. There are three basic postulates upon which the theory is founded:

> (1) perceptual-motor functions develop through specific steps of sequential maturation, (2) there are identifiable areas of perceptual-motor dysfunction and, by inference, specific central nervous system mechanisms critical to the integrative process which enable perception, and (3) both sequential maturation and the central nervous system integrative mechanisms are dependent upon patterned stimulation and meaningful response or use of the stimuli (1).

In general, the purpose of the Title III Project is to assist children who have delayed or disordered perceptual-motor development, but who otherwise possess normal intellectual potential. It was hypothesized that through earlier identification and remedial intervention, academic failure and other insults to a child's self-concept could be greatly reduced.

In addition to Dr. Ayres and Mrs. Wilbarger, other specialists providing leadership in the Project include psychologists; a physical education consultant in research and motor learning, Dr. Vera Skubic; and physical education activities specialists. Specialists in auditory perception, testing and evaluation, and education are involved in the Project as well as nurses and other medical consultants. Seven school districts located in Santa Barbara, Ventura, and San Luis Obispo counties in California have participated in the Project.

The Project was established as a three-year plan. The first year dealt with kindergarten children; in the second year, children suspected of having dysfunction or delayed development were continued in a program at first grade level along with a second group of kindergarten children. It was planned to continue the program into second grade. However, it was decided to concentrate on kindergarten and first grade levels with as much a program as possible for second graders.

The final evaluation will not be held until each group of children in the program, along with each control group, is finishing third grade.

In the summer of 1968, a two-week summer workshop involving consultants, specialists, and kindergarten teachers was held. Dr. Ayres provided the theoretical background during the first week. This was followed by one week of practice in activities and diagnostic testing, and working with children.

In the fall, tests were administered to kindergarten children. The tests covered various areas of dysfunction as described by Dr. Ayres along with a test in the area of auditory language. For the children suspected of having dysfunction, additional tests were given. This was followed by a program of remedial activities.

The following spring, orientation workshops were conducted in each district for first grade teachers, new kindergarten teachers, and auxiliary personnel. This was excellent because the teachers arrived at the following summer workshop better prepared than the teachers were the previous year. In addition, the two groups of teachers were able to work together and gain greater insight and depth into the program during that second summer workshop.

> The project objective is to assist 85 percent of those primary school children with perceptual-motor handicaps in acquiring appropriate achievement on measures of academic performance and adaptive behavior.
>
> Grade appropriate academic performance is defined for kindergarten students as a score of A, B, or C on the year end Metropolitan Reading Readiness Tests, and a rating of 3, 4, or 5 on Number Recognition, Counting, Word Recognition, and Vocabulary on the Academic Readiness Scale (Burks, 1968). First grade academic achievement is defined by scoring in the 4th stanine or better on the year end, state mandated first grade reading tests.
>
> Achievement on measures of adaptive behavior are considered to be shifts in scores on auditory-language perceptual motor tests from scores within the lower 16 percent performance range to scores greater than the lowest 16th percentile. The Academic Readiness Scale (Burks, 1968) will be used as a year end measure of adaptive behavior with the kindergarten group and a teacher rating of 3, 4 or 5 on motor, perceptual-motor, persistence, memory, attention, interest in the curriculum, social, humor, emotional items.
>
> Perceptual-motor handicaps for this Project's purposes are defined as at least six different groups of problems. These groups or "syndromes" have been identified as each contributes to difficulty in academic achievement or adaptive skill needed in the elementary school setting (2).

The perceptual-motor handicaps have been identified as:

1. *Apraxia,* a lack or deficit in ability to plan and execute purposeful skilled movement or difficulty in fine motor planning. It is thought to be a disorder in integration of tactile stimuli. Children with apraxia have poor body scheme development, are apt to be clumsy, and have difficulty with writing and physical education activities.

2. *Disorder of postural and bilateral integration,* difficulties in postural and equilibrium reactions and in coordination of the sensory information and movement of one side of the body with that of the other side of the body, irregular or incoordinate horizontal eye movements, delayed development of laterality concepts and possible poor sequential visual perception. Children with problems in this area are likely to experience difficulty in reading or to exhibit certain types of coordination problems in school.

3. *Disorder in form and space perception,* difficulty with various aspects of visual perception as well as with interpretation of form by tactile and kinesthetic perception. Children with form and space perception problems may have difficulty recognizing and reproducing geometric

forms, spacing drawings or arithmetic problems, or putting puzzles together. This may reflect difficulties in integration and related development of meaningful perception of the relationship between one's own body scheme and objects in space.

4. *Disinhibition, tactile defensiveness, attention system disorder,* terms used roughly synonymously to describe the hyperactive, distractable child who is oversensitive to various kinds of stimuli . . . . aggressive or avoidance response to being touched. . .
5. *Deficit in function of left body side as compared to the right* . . . . avoids using left body side in activities or has significantly poor skill in using his left arm or leg in comparison with the opposite body side . . . . may be due to dysfunction in the right cerebral hemisphere.
6. *Auditory-language deficit,* difficulty in perceiving, processing, reproducing, or recalling auditory sequences. Children with difficulties in this area exhibit difficulty in understanding directions, misinterpreting words, and have difficulty in expressing themselves verbally. . . (2).

A film on activities for perceptual-motor dysfunction was presented; the film was produced by Dr. Ayres and shows examples of some of the activities.[1]

Implications for Physical Education

1. Reinforcement of the need to start a well planned program of developmental activities at kindergarten level—earlier, if possible.
2. The need to start at a beginning level—literally, from the ground up. To work on such factors as balance, coordination, and bilateral integration in a wide variety of activities in prone and supine position, on all fours, sitting, kneeling, and standing.
3. The need to perceive and implement the various developmental sequences in greater depth.
4. Reinforcement of the need to add challenges sequentially and gradually to provide success and a positive self-concept.
5. Reinforcement of the values of movement exploration and creative rhythms through which children make adaptive responses within self-directed activities resulting in added growth.

This last one has really been the one that has given me a change in perspective. As a physical education person I have always been interested in the *product*—does the child move efficiently, can he skip, is he able to hit the target? Now I realize the importance of the *process* in terms of the contributions to his ongoing level of maturity and "readiness." In addition, if I provide the many experiences needed, I will be strengthening the gaps. By working from the inside out, the child will be more secure as a motor-being, more successful in motor activities, and be able to use movement skills automatically. This will give him an opportunity to attend more closely to cognitive skills. At the same time, the *product* about which I am so concerned as a physical educator will emerge naturally, and will be far more lasting.

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[1] *Therapeutic Activity for Perceptual Motor Dysfunction,* available from University of Southern California, School of Performing Arts, Film Distribution, Cinema Division, Los Angeles, Calif. 90007.

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PERCEPTUAL-MOTOR ASSESSMENT INSTRUMENTS

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Introduction

The nature of the physical educator's role in the study of perceptual-motor learning is still unclear. Five years of involvement have not yielded agreement or definition of what is a "perceptual-motor act." Not until the second day of the 1968 AAHPER Symposium was a definition attempted by the participating body. Even then, the panel composed of experts from varied disciplines could not settle on a definition.

Since we are to give a brief summary of perceptual motor assessment instruments, perhaps we should agree to a working concept of the perceptual-motor act. Kephart (3) points out that there is a cyclical nature to the activity of the child in any given task. First of all, there is an *input* process which is, in essence, the sensing or sensory process. Secondly, there is an integrating or internalizing process which is the *perceiving* of the input. Thirdly, there is an *output* or motor response resulting from the two preceding phases of the cycle. Lastly, there is a *feedback* to the individual as a result of his response which, in turn, may fortify or modify responses to subsequent similar input situations. It is this combined process of sensing, integrating, responding, and interpreting feedback information which can serve as our working concept for the perceptual-motor act.

Instruments

Instruments which attempt to assess a child's perceptual-motor process by this definition obviously are fraught with limitations. This is particularly true because the only manifestation of the internal processes of sensing and integrating is the individual's response. Thus, while the ability may be assessed in total, it may be difficult to ascertain the relative role of input (sensing, integrating) and output (motor response) in the process.

Since we are concerned here primarily with the practical application of perceptual-motor appraisal, no attempt will be made to discuss refined laboratory instruments which assess aspects of the perceptual-motor process. Instead, let us briefly review selected instruments of a clinical nature which have been established by pioneers in perceptual-motor studies, as well as selected instruments used in some school settings. This summary is presented without evaluative comments in the charts on pages 45 and 46.

Interpreting Instruments

One is both justified and obligated when using an assessment tool to ascertain what, in fact, is being measured. Since no critical appraisal has been attempted of the instruments presented here, let a case study of a tool construction effort serve as a caution to you in interpreting findings.

An investigator was asked by administrators of a school district to "appraise physical performance of kindergarten children for the purpose of assisting in the identification of individual readiness for first grade." A problem which had plagued one of the principals in the system was the lack of objective information supporting teacher judgment when talking to parents of children who were recommended for "ready room" instead of for first grade.

The investigator, unconvinced that such information would result from a physical performance test, agreed to try to construct "a motor ability test for kindergarten use." Criteria were set up for the test: it must be a dynamic gross movement test; it must have low cognitive content; and, it must include the recognized elements of motor ability–coordination, balance, agility, and a sense of awareness when moving in space.

A dozen items were selected for pilot work, each satisfying measures of the criteria to some degree. Finally, five items which had reasonably low correlations with each other but had at least moderately high reliability and objectivity coefficients were selected. Two of these were

(Text continued on page 51.)

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[1] Material presented by Dr. Virginia R. Crafts, Illinois State University, Normal, Ill.

CHART I

SUMMARY OF SELECTED PERCEPTUAL MOTOR TOOLS

Name or Source of Instrument	Age or Grade Level	No. of Items	Need of Equipment	Administrative Ease	General Comments or Description
Perceptual Motor Rating Scale (Kephart) (3)	6 to 9 years old	11	Very little needed, balance beam & blackboard	Classroom or special teacher may administer Individually administered	Tasks designed to permit observation of child by teacher in relatively short time. Through the tests preliminary selection of training methods can be indicated.
Developmental Profile (Doman Delacato) (2)	Birth to 96 months	3 expressive; 3 receptive	Very little equipment needed	Specialist (non-teacher)	Observations on six categories of brain function in seven stages given a "neurological age."
Frostig Developmental Test of Visual Perception (1)	3½ to 7½ years old	5 visual perceptual abilities	Very little equipment needed	Teacher may administer test Individually administered	Test for independent development of 5 visual perceptual abilities and suggests relative need for visual training.
Denver Developmental Screening Test (5)	1 month thru 6 years	Multi-item in 4 basic categories	Special equipment for many items	Specialist should administer Individually administered Approximately 30 minutes	In 4 categories (gross motor, fine motor, language, and personal-social), child is tested on a number of specifics. The percent of children passing or failing each item for a given age span is indicated.

CHART II

SUMMARY OF SELECTED PERCEPTUAL MOTOR TOOLS

Name or Source of Instrument	Age or Grade Level	No. of Items	Need of Equipment	Administrative Ease	General Comments or Descriptions
Dayton Sensory Motor Awareness Survey (4)	4-5 years	15 simple items	Special board; 8-ft. line; newspaper; watch; table; stick	Classroom teachers may learn to administer Individually administered Approximately 12 min. per student	15 simple items include body image, space direction, rhythm, balance, and various kinds of coordination and form perception
Pontiac Kindergarten Perceptual Motor Screening Test (7)	4-6 years	6 simple items	Balance beam (8 ft. x 4 in.); mat; pillow	Classroom teacher may administer Individually administered Approximately 5 min. per pupil	Six items consisting of balance, strength, jumping, skipping, and refined muscle coordination
Project Genesis Perceptual Motor Screening (Lakeview Schools, St. Clair Shores, Michigan) (8)	5-7 years	28 simple items	Ball; target	Approximately 15 min.	Judgment on quality of general performance
Minnetonka Physical Performance Readiness Test (6)	5-7 years	5 items	Watch; small balls; 3 buckets; marked areas on floor	Classroom teacher may give. Best in groups of 3 or 4 students Approximately 5 min. per person	Hand-eye coordination, balance, agility, accuracy of body placement, forward, sideward and backward

DAYTON

SENSORY MOTOR AWARENESS SURVEY FOR 4- AND 5-YEAR-OLDS

Date of Test____________________

Name____________________ Sex______ Birth ____________ Center ____________

Body Image. ½ point for each correct part; 9 points possible.

_____ 1. Ask the child to touch the following body parts:

head ________
toes ________
eyes ________
wrists ________
back ________
ankles ________
nose ________
feet ________
chest ________
elbows ________
ears ________
legs ________
mouth ________
fingers ________
stomach ________
chin ________
waist ________
shoulders ________

Space and Directions. ½ point for each correct direction; 5 points possible.

_____ 2. Ask the child to point to the following directions:

front _______ back _______ up _______ down _______ beside you _______

Place 2 blocks on a table about 1 inch apart. Ask the child to point:

under _______ over _______ to the top ____ to the bottom ____ between _______

Balance. Score 2 points if accomplished.

_____ 3. Have the child stand on tiptoes, on both feet, with eyes open for 8 seconds.

Balance and Laterality. Score 2 points for each foot; 4 points possible.

_____ 4. Have the child stand on one foot, eyes closed, for 5 seconds. Alternate feet.

Laterality. Score 2 points if the child keeps his feet together and does not lead off with one foot.

_____ 5. Have the child jump forward on two feet.

Rhythm and Neuromuscular Control. Score 2 points for each foot if accomplished 6 times; 4 points possible.

_____ 6. Have the child hop on one foot. Hop in place.

Rhythm and Neuromuscular Control. Score 2 points.

_____ 7. Have the child skip forward. Child must be able to sustain this motion around the room for approximately 30 feet.

Integration of Right and Left Sides of the Body. Score 2 points if cross patterning is evident, for each.

_____ 8. Have the child creep forward.

_____ 9. Have the child creep backwards.

Eye-Foot Coordination. Score 2 points if done the length of tape or mark.

_____ 10. Use an 8-foot tape or chalk mark on the floor. The child walks in a crossover step the length of the tape or mark.

Fine Muscle Control. Score 2 points if paper is completely crumpled. Score 1 point if paper is partially crumpled. Score 0 points if child needs assistance or changes hands.

_____ 11. Using a half sheet of newspaper, the child picks up the paper with one hand and puts the other hand behind his back. He then attempts to crumple the paper in his hand. He may not use his other hand, the table, or his body for assistance.

Form Perception. Score 1 point for each correct match.

_____ 12. Using a piece of paper with 2-inch circles, squares, and triangles, ask the child to point to two objects that are the same.

Form Perception. Score 1 point if circle is identified correctly.
Score 2 points if the triangle and square are identified correctly.

_____ 13. Ask the child to identify by saying, "point to the circle."
"Point to the square."
"Point to the triangle."

Hearing Discrimination. Score 1 point if the child taps correctly each time.

_____ 14. Ask the child to turn his back to you. Tap the table with a stick 3 times. Ask the child to turn around and tap the sticks the same way.

Ask the child to turn his back to you. Tap the table again with the sticks (2 quick taps, pause, then 2 more quick taps). Have the child turn back to you and tap out the rhythm.

Eye-Hand Coordination. Score one point for each successful completion.

_____ 15. A board is used with 3 holes in it. The holes are 3/4, 5/8 and 1/2 inches in diameter. The child is asked to put his finger through the holes without touching the sides.

PONTIAC SCHOOL DISTRICT

Department of Physical Education, Athletics and Recreation

Student's Name____ Sex_______________

Tester's Name____

School _________________________________ Teacher's Name____________________

Birthdate: Month ________________________ Year____________________________

KINDERGARTEN PERCEPTUAL MOTOR SCREENING TEST

	Pretest		**Posttest**	
1. BALANCE BEAM				
Tasks –				
1. Walks forward on 8' x 4" beam without stepping off.	Yes ☐	No ☐	Yes ☐	No ☐
2. Walks backward on 8' x 4" beam without stepping off.	Yes ☐	No ☐	Yes ☐	No ☐
3. Walks sidewards left on 8' x 4" beam without stepping off.	Yes ☐	No ☐	Yes ☐	No ☐
4. Walks sidewards right on 8' x 4" beam without stepping off.	Yes ☐	No ☐	Yes ☐	No ☐
2. SKIPPING				
Task – Skip 30 feet without breaking alternating rhythm.	Yes ☐	No ☐	Yes ☐	No ☐
3. STANDING BROAD JUMP FOR DISTANCE				
Task – Emphasize takeoff with both feet and measure distance to nearest inch.	Ft.	In.	Ft.	In.
4. UPPER BACK STRENGTH				
Task – With feet (without shoes) held firm with arms behind neck, child lifts head and chest off mat as high as possible (place pad under hips). Hold for 10 seconds.	Yes ☐	No ☐	Yes ☐	No ☐
5. LOWER BACK STRENGTH				
Task – With pad under hips, child lifts feet (without shoes) as high off mat as possible and holds for 10 seconds.	Yes ☐	No ☐	Yes ☐	No ☐
6. WINKING				
Task – Student can wink with either eye.	Yes ☐	No ☐	Yes ☐	No ☐

LAKEVIEW SCHOOLS – ST. CLAIR SHORES, MICHIGAN

PROJECT GENESIS

PERCEPTUAL-MOTOR SCREENING

WALK BALANCE BEAM

1. Can he use both sides of body to balance?____________________
2. Can he recover his balance?____________________
3. Does he avoid the task?____________________
4. Does he need to watch his feet when walking?____________________

JUMPING AND HOPPING

1. Can he stand up straight and close his eyes, with arms outstretched in front of him?__________
   Does he waver at all?____________________
2. Can he stand on one foot successfully?____________________
   Which foot?____________________
3. Can he hop on that foot?____________________
   The other foot?____________________
   Both feet?____________________
4. Can he skip around you?____________________
   Is the skip smooth; more of a gallop; unsuccessful?____________________

IDENTIFICATION OF BODY PARTS

1. Can he touch the body part called for in a prompt fashion?____________________
2. Does he touch the described body part accurately as opposed to "feeling around" for it?__________
3. Does he touch both members of a pair (ears, knees, etc.)?____________________
4. Can he identify the part being touched?____________________
5. Is he aware of up-down directions?____________________

THROW

1. Does he consistently throw with the same arm?____________________
2. Does he keep his eyes on the object to which he throws?____________________
3. Can he control his throws?____________________

CATCH

1. Does he back away from the ball when it is thrown?____________________
2. Does he blink or close his eyes when attempting to catch the ball?____________________
3. Does he use both hands in a coordinated fashion to catch the ball?____________________
4. Does he hold his arms rigid?____________________

ANGELS-IN-THE-SNOW

1. Can he visually identify the part to be moved or does he need to have the body part touched?______________________________
2. Does he move his limbs smoothly and decisively?______________________________
3. Is there overflow into other limbs?______________________________
4. Can he make necessary corrections with only one repetition of instructions?______________________________
5. Does he follow directions easily?______________________________
6. Can he focus his attention on the activity at hand?______________________________
7. Is he distracted easily?______________________________
8. Is he apprehensive in performing activities?______________________________

timed ball placement tests and three of these were variations of forward, backward, and sideward hopping for accuracy tests.

It was also determined that each test item clearly differentiated between the previous year's kindergarten children, who now comprised the "ready room group," and the first grade group. This kind of validation was replicated in different schools within the district under study. The tests were then given to the kindergarten class. There was significant agreement between the teacher's judgment and the identification of the children by the "motor ability" tests at the same time.

However, in the process of testing, the investigator noted that scores on both the ball placement test and the hopping for accuracy test were probably more related to behavior patterns than to inherent motor ability. For example, confidence or lack of confidence was often obvious–no matter what was the test item. Though the items were simple to perform, frequency of mistakes and ability or inability to recover from mistakes were differentiating factors in performance. Similarly, pace, deliberation, and concentration were reflected in the scores in some way.

The question of whether or not any "motor ability" was being tested was raised. It was decided that simple familiar movements of walking and running be tested to see if they differentiated between the two groups. They did not. It was concluded that the ball placement test and hopping test appeared to have face validity as motor ability tests–more so than did the walking and running tests. Yet, it was equally obvious that the scores did, in fact, reflect the child's characteristic pattern of behavior which was present no matter what requirement was made of him. It became more plausible to accept the high degree of agreement between the kindergarten teacher's identification of "ready room candidates" and the "motor ability" test results.

From the principal's point of view, the tests proved useful since they offered additional evidence to differentiate between first grade and "ready room" candidates. They provided objective information which was supportive of teacher judgments based on classroom performance and which, at times, gave new insights to the teacher about her students. From the investigator's viewpoint, the tests pointed candidly to the fact that motor ability alone was not being tested. The tests helped to point out that when a new requirement is put upon students to perform in some way, though good testing procedures are followed, characteristic patterns such as self-confidence and ability to adjust, play an important role in the determination of the quality of final performance.

As illustrated in this case, the identification of relationships (teacher "ready room" designation and low "motor ability" scores) can mislead unless the mechanisms or reasons for relationships are ascertained. The reasons, when analyzed, may lead both to better assessment procedures and to a base upon which appropriate activity programs can be created.

Minnetonka Physical Performance Readiness Test

Since the Minnetonka Physical Performance Readiness Test is an instrument which emerged from a sound research approach, let us see a film of the administration of the test. Five items are involved. About 12 to 15 minutes are required to test 3 people on all 5 items. The test is for 5 to 7 year olds.

1) Jumping in squares (12")
   Forward back = 5 each – 10 = 20
   Lateral = 10
2) Complex jumping
   Forward skipping a square, back one & 50 on. = 5

3) Jumping back = # of times in 10 seconds
   Lateral = # of times in 10 seconds
   # of times person crossed the line is the important factor
4) Ball placement test – 3 buckets with golf balls (50) in middle bucket. Put balls into side bucket using both hands simultaneously. Hand placement is regulated (center). *Put* balls in; not throw them – scored by time.
5) Agility and accuracy in ball placement– This is a shuttle test. Twenty balls are in one basket 6′ from another basket. Point is to transfer the balls from one basket to another scored by time.

Note: All worked out their own patterns.

Comments presented by Dr. Crafts

At this point I would like to offer my own comments and observations on the nature and use of perceptual-motor assessment instruments and training programs.

Many specific tests seem to be good for identifying youngsters who are purported to have high and low perceptual-motor abilities. Whether one accepts or rejects the idea that this high-low discrimination does in fact really occur from use of such a variety of tests, some probing questions must be asked.

First, do assessment tests have any commonality as to categories investigated and items employed within the categories? A cursory analysis of some of the clinical and educational perceptual-motor assessment tools, in terms of categories and items employed, reveals some interesting observations. Categories most often employed are: balance, body image, coordination and fundamental patterns, and fine motor competencies. The categories next used most frequently were directionality, laterality, forms and figure ground, ocular exercises, and physical fitness. Least used as categories but always involved indirectly are language, personal-social, memory, attention, comprehension, and confidence. Items within the same categories in the different assessment instruments were variations on a theme. That is, while they were different to the eye as to what might be used for equipment or for task description, the *real* problems underlying the tasks were often similar.

What do these observations mean? Perhaps nothing. Perhaps, however, there is a need to explore the considerations that each competency relevant to the establishment of an accurate perceptual world needs to be tested, but that any of a number of specific tests *might* be used within particular categories. Thus, if five items have been used to test for dynamic balance, is there one which is best? Are they equally good? Of course, it is possible that for gross discrimination purposes, assessment tests might use only a few categories or even one category. These types of assessment instruments obviously would be limited in use to screening rather than for remedial action. Research done on a factor analysis basis as well as correlation studies would seem to be needed if the questions raised are to be answered. If such research seems important, could not a national approach be taken, as was done in the physical fitness research?

Also, do the assessment instruments really test what we think they do? I, too, along with some of the other speakers, wish to suggest that caution must be used in interpreting our testing scores and that the why of the score must be considered and specificity sought. It is entirely possible that what we test with many of the perceptual-motor items is the ability individuals have on how to learn in general. By this I mean that youngsters have learned a way to attack problems or have no concept of how to attack them and so have established various patterns of behavior. Dependent on how flexible and insightful the how-to-learn approaches may be, the perceptual-motor testing may yield quite different or similar performances on some category item. Could it be that we are testing the ability to interpret feedback and to know therefore how to correct errors? Or is it attention span? Confidence? Our expectations of the child?

Finally, there is a need for the physical educator to view his involvement in the perceptual-motor area from two perspectives. One is the teaching of classes of the so-called normal children so that the best perceptual-motor experiences possible occur within the physical education framework. In other words, optimal learning is the goal. This would mean a program with varied content, taught in such a way that enhancement of optimal learning within the social, emotional, intellectual, and physical spheres would be plausible. Implementation of this concept would obviously require a strong emphasis on the perceptual-motor domains. The movement education approach might be used with some valid justification to achieve the preventive, self-actualizing program proposed.

The second perspective that the physical educator must have relates to programs for youngsters with problems in the perceptual-motor area and in other areas. Perhaps a major role of a physical educator might be the identification of youngsters who are having perceptual-motor difficulties in the regularly scheduled physical education classes. This kind of approach might also be used in other subject areas. Thus, if each area of learning were to

PERFORMANCE PROFILE

Name ______________________ Grade ______________________ Date ______________________

N=215 Kindergarten – Minnetonka Schools-Dist. 276

STANDARD SCORE	BALL SET		BALL MOVING		HOPS 2 Ft.		HOPS ALT.		TIMED HOPS		
SS	Record SEC.	Rating R	SEC.	R	NO.	R	NO.	R	NO.	R	
100	23.5		53.5		20 pts.		10 pts.		37.5		7
95											
90	27.0		57.5		20		10		34.0		
85											6
80	30.5		61.5		19		9		31.5		
75											
70	34.0		65.5		17		8		28.0		5
65											
60	37.5		69.5		15		7		24.5		
55											4
50	41.0		73.5		13		6		21.0		
45											
40	44.5		77.5		11		5		17.5		3
35											
30	48.0		81.5		9		4		13.0		
25											2
20	51.5		88.5		7		3		9.5		
15											
10	55.0		89.5		5		2		6.0		1
5											
0	58.5		93.5		3		1		2.5		

identify youngsters who were having learning difficulties in their respective classes, this group might then constitute the special group who would receive further diagnostic testing and remedial programs from a multidisciplinary approach. The physical educator obviously should be involved in such a group undertaking.

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REVIEW OF DATA PROCESSING TECHNIQUES NEEDED TO INTERPRET MENTAL-MOTOR RELATIONSHIPS IN CULTURALLY DEPRIVED HIGH SCHOOL STUDENTS

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Introduction

The relationships among mental and motor variables have been investigated under the assumption that they jointly comprise part of an integrated behavior syndrome influencing the development of the human organism. Authorities such as Ismail, Kephart, and Cowell (7); Ismail and Gruber (8); Yoder (16); and Kirkendall (9), when utilizing both univariate and multivariate data processing techniques, have produced information which consistently tends to support the validity of the stated assumption. Briefly, these investigators have demonstrated that items measuring coordination of the arms and legs correlate to a higher degree with intellectual performance than do items which measure growth, strength, speed, and power. In a study on first, third, and fifth grade children, Plack (15) found simple correlations between reading achievement and tests of agility and coordination to be unusually high, ranging from a low of .64 to a high of .87. Kirkendall (13), employing discriminant function analysis, demonstrated that it was possible to differentiate among high, medium, and low academic achievers with both coordination and fitness motor items. All of these investigators used so-called normal elementary school boys and girls as subjects in their studies.

Purpose

The purposes of this paper are to acquaint the reader with the nature of relationships between mental and motor performance in a special group of high school students, and to indicate the need for utilizing both multivariate and univariate data processing techniques. Both methods are needed to identify relationships not only between two behavior domains, but also to assist in determining the contribution of selected items in each domain to the overall relationship.

Procedures

Sampling Procedures. The students participating in this study were the entire population of 96 students, ages 14 through 17, at Lincoln School, Simpsonville, Kentucky. Because of health, orthopedic, and discipline problems, only 91 subjects (girls-44, boys-47, Negro-41, white-50) in grades 9 through 11 completed the study. Lincoln School provided a residential setting for culturally deprived pupils achieving below tested capacity at time of admission.

Measuring Instruments and Procedures. For purposes of this paper, data from only 12 variables were utilized.[1] Information concerning the validity of these measures can be found in the references cited. The variables included were:

a) six items purported to measure coordination of the arms and legs (10)
b) six intellectual achievement measures–*Kuhlman-Anderson I.Q.* (14); *Verbal Stanford Achievement; Quantitative Stanford Achievement; Total Stanford Academic Achievement* scores; the intelligence factor of the *High School Personality Inventory* (2); and a teachers classroom achievement rating.

The *IPAT-HSPQ* personality inventory, the *Kuhlman-Anderson I.Q.*, and the *Stanford Academic Achievement* tests were administered in a standardized testing environment by the Lincoln School psychologist. The classroom academic achievement rating was done by the teachers on a paired comparison basis. The coordination items were administered in a private session to each child by the authors of this paper. All testing was conducted as part of the routine year-end achievement testing at Lincoln School.

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[1] For more extensive reports of the relationships among the total pool of 34 items selected from the mental, motor, emotional, and social domains, the reader is directed to reference numbers (5), (6), (11), (12).

Data Processing. In an effort to eliminate any possible maturational contamination of certain data, the *Stanford Academic Achievement* scores were converted to T-scores by grade. The *Kuhlman-Anderson I.Q.* scores are inherently adjusted for age. All other data were utilized in their raw score form.

Simple Pearson-Product Movement Correlation Coefficients for all possible pairs of items were calculated for the total group. This procedure enables one to examine the relationship between individual pairs of items taken one at a time from larger domains of behavior. However, this univariate analysis does not provide any information as to the relationship between the much larger mental and motor domains. The factor analysis technique also does not take into consideration the magnitude of relationships between domains. In an effort to eliminate this deficiency, the data were also submitted to canonical correlation analysis. Canonical correlation provides for the maximum correlation between two sets of linearly combined variables. The procedure in canonical correlation is to find the vectors of weights such that the maximum correlation between the domains is obtained. The magnitude of the normalized weights in each domain vector indicates the relative amount of contribution the individual variables are making in the correlation between the two sets of variables. In order to test the significance of each canonical correlation found, Wilkes Λ criterion was used and transformed into χ^2 as outlined by Cooley and Lohnes. (3)

Analysis of Data

By observing the simple correlation coefficients in Table 1, it can be seen that the highest correlations were among variables in the intellectual domain. The *Verbal Stanford Achievement* and *Quantitative Stanford Achievement* correlated .77 and .67 respectively with the *Total Stanford Academic Achievement* score. This was to be expected since the total score is really the summation of the two subtest scores. The correlation between *Verbal and Quantitative Stanford Academic Achievement* was a low .34. The highest correlation between the paired comparison achievement rating and any other intellectual achievement measure was .43 with the *Total Stanford Academic Achievement* score. The *Kuhlman-Anderson I.Q.* measure had a low correlation of .26 with *Factor B- General Intelligence of the HSPQ.* This suggests that different types of scholastic achievement, as well as intelligence, was being exhibited by this special group of high school students. In other words, there appears to have been specificity of cognitive function present in this group. Hence, any *one* measure of intellectual performance most certainly will not provide the type of evidence that can approach the true state of affairs in this multifaceted phenomena that we call cognitive function or the "intellectual domain."

The highest correlation found among the coordination measures was .64 between two hopping items. The correlations between items measuring coordination of the arms and legs were generally low and insignificant. This would indicate specificity of limb coordination.

The only significant correlations between coordination items and intellectual performance measures were .26 between arms and legs, together with the intelligence trait of the *HSPQ;* -.25 between arms -6 counts and *Verbal Stanford Achievement;* and -.24 between hop 2RIL and *Verbal Stanford Academic Achievement.* The remaining correlations between the individual pairs of coordination and intellectual achievement items were non-significant. Based on this univariate data one might erroneously conclude that the mental and motor domains were generally unrelated, or that in this special population of high school students a meaningful perceptual-motor relationship was not detectable. This could be due to the fact that the elements of one domain (mental) were not allowed to relate with a set of behavior elements from another domain (motor). In reality, human behavior is a "gestalt" phenomena and every effort should be made in the primary research design to identify the more global relationships between behavioral domains.

In order to overcome the deficiencies of univariate analysis just alluded to, the data were submitted to canonical correlation analysis. The first computation printout of the analysis revealed that the *Total Stanford Academic Achievement* score and paired comparison score contributed no information to the relationship. Thus, these two intellectual items were dropped from the final analysis in order to conserve degrees of freedom. The results of the canonical correlation analysis between the six item coordination sub-domain[2] and the intellectual do-

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[2] Kirkendall and Gruber (11). The reader's attention is called to this paper where three significant canonical correlations are discussed in detail. The first (.551) between an intellectual domain of 4 items and a total motor domain of 11 items (5 fitness and 6 coordination). The second canonical correlation (.421) was between the 4 item intellectual domain and a 5 item fitness sub-domain. The last correlation of .439 was between the 4 item intellectual domain and the 6 item coordination sub-domain.

TABLE 1*

MENTAL AND MOTOR INTERCORRELATIONS, MEANS AND STANDARD DEVIATIONS⁺

ITEMS	1	2	3	4	5	6	7	8	9	10	11	12	X	S.D.
1. HR & L (Hopping)		.05	.64	.35	.18	.27	.20	-.06	-.07	.01	-.09	.00	26.29	8.63
2. Arms – 6 Counts			.15	.08	.26	.22	.11	.00	-.25	.04	-.10	.04	23.00	6.41
3. H2R1L – (Hopping)				.28	.06	.15	.06	-.14	-.24	.05	-.19	-.09	26.34	7.19
4. Hop – 12 Counts					.15	.50	-.01	.10	-.04	.11	-.04	.11	50.70	18.39
5. Arms – 8 Counts						.36	.15	.18	.03	.10	.13	-.07	33.53	9.56
6. Arms & Legs							.26	.10	.06	.09	.07	.00	22.31	8.39
7. B-Intel (HSPQ)								.26	.26	.02	.18	-.02	7.79	1.22
8. Kuhl – I. Q.									.46	.45	.62	.18	122.74	8.20
9. Stan – Verb.										.36	.77	.30	49.92	8.47
10. Stan – Quant.											.67	.34	50.22	9.15
11. Stan – Tot.												.43	50.20	6.28
12. Paired Comp.													50.18	21.61

⁺ With 89 degrees of freedom a correlation of .20 is significant at the .05 level
*abstracted from Gruber and Kirkendall (5).

TABLE II

CANONICAL CORRELATIONS BETWEEN COORDINATION AND INTELLECTUAL ACHIEVEMENT⁺

Canonical Correlation	Canonical^2 Correlation	Wilks' Λ	χ^2	DF
.439	.193	.6482	36.634*	24
.363	.132	.8033	18.507	15
.255	.065	.9251	6.582	8
.103	.011	.9894	.897	3

*Significant at .05 level.

⁺Abstracted from Kirkendall and Gruber (11).

main comprised of four measures are presented on Table II. The maximum correlation obtained was .439. The first χ^2 test performed indicated this to be a significant ($\alpha = .05$) relationship between the mental and motor domain. The remaining χ^2's which were not significant at the .05 level indicated that only the vectors of weights associated with the first canonical correlation would allow meaningful statistical interpretation. Those vectors, which indicate the relative contribution of the individual items from each domain (normalized weights) are presented in Table III.

The normalized weights in each vector associated with the significant canonical correlation between the intellectual domain and the coordination domain indicate that the individual items (e.g., arms-6 counts and hop 2R & 1L) were the primary motor contributors. It is interesting to note that each of these items represents different limb coordination. The intellectual achievement domain was almost exclusively represented by *Factor B* of the *HSPQ* (General Intelligence vs. Dullness) in this relationship. This would suggest that according to Cattell's (2) interpretation of Factor B, a person who had high conceptual ability or abstract reasoning was likely to perform well certain arm and leg coordination tasks. Such relationships were not apparent in the univariate analysis previously reported. It is also noteworthy that the interaction of items from the two domains provides for a clearer picture of those elements in each domain which make primary contributions to the significant overlap between mental and motor performance. Thus, a more meaningful interpretation of the relationship between the mental and motor domains is provided to scholars in the field.

TABLE III

RELATIVE CONTRIBUTION OF EACH VARIABLE IN THE RELATIONSHIP BETWEEN COORDINATION AND INTELLECTUAL ACHIEVEMENT⁺

Coordination Vector	Intellectual Achievement Vector
7.5 Hop R & L	75.3 Factor B – *HSPQ*
39.9 Arms – 6 Counts	-3.6 Kuhlman-Anderson I.Q.
31.7 Hop 2R & 1L	-13.7 Stanford-Verbal
-5.3 Hopping – 12 Counts	7.4 Stanford-Quantitative
-3.4 Arms – 8 Counts	
12.2 Arms & Legs	
Canonical Correlation = .439	

⁺Abstracted from Kirkendall and Gruber (11).

Discussion and Conclusions

The information in this paper would support a recommendation that future research be designed in such a way as to allow for primary multivariate analysis of data. Results from a number of studies (5), (7), (8), (9), (15) demonstrate that significance, direction, and magnitude of simple relationships can vary from sample to sample. Hence, information concerning meaningful relationships may be lost if we solely employ univariate tools. This could lead to a possible erroneous conclusion concerning status of relationships across samples or within a sample of subjects.

It is essential that the integrated whole behavior pattern be revealed first since total behavior possesses a unique demonstrability that may be undetected in a part analysis. Multivariate analysis can produce consistent behavioral relationships between domains from sample to sample (9), (11), (13). In this sense, the canonical correlation approach is perhaps a more reliable estimate of relationships between domains when replicating studies on different samples. This may be due to the fact that this technique, by virtue of including more items (behavior traits) in each domain studied, comes closer to a more realistic estimate of the actual relationship between domains. This *may* be analogous to an accepted principle of test construction, namely, that increasing the number of items in a test usually has a favorable effect on test reliability. Admittedly, the authors of this paper are unaware of mathematical proof for this comparison.

Based on the information available on this special group of high school students, the following may be concluded:

1. The univariate correlation approach uncovered only a few low correlations between mental and coordination type motor items.
2. There appears to be specificity of function among measures of academic achievement as well as among I.Q. measures.
3. The low correlations between arm and leg coordination items would indicate specificity of limb coordination.
4. The multivariate canonical correlation analysis permitted a clearer picture of those specific items from each domain which had the greatest influence in the overall relationship. In fact, items thought to be unimportant in the univariate analysis became quite importatnt in the canonical relationship between the mental and motor domains of behavior.
5. Careful examination of the weight of items, as well as the simple correlation coefficients, should reveal specificity of trait behavior which may be unique to a particular sample of students. Thus, both the multivariate and univariate data processing techniques should be utilized in behavioral science research.

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THE PHYSICAL EDUCATOR'S ROLE IN ACADEMIC READINESS

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The physical educator's role and academic readiness are of particular interest to me. For an optometrist to be talking about what physical education is going to do for academic readiness may sound a little far-a-field until you realize that I spent most of my clinical life trying to understand how a child learns to see. The child is born with the equipment, but what is the process by which he learns to use it? This question has almost automatically put me into a position of getting a lot of observational, clinical, and statistical information on the learning process. When we start talking about the learning process, then we are all in the same boat.

Each man is entitled to his own form of insanity, and to his own biases and prejudices. One of my real prejudices is that I will not waste my time reading research done on college students and guinea pigs that is then applied to primary grade children. These are just not the same kind of situations. Yet, this type of research was done by Socony Vacuum Oil Company.

They were interested in how they could best train their employees. This was why they looked hard at what information a person retains. All of us are, one way or another, involved in helping children retain information; but, we must go one step further. We see too many scholars full of information which they can't apply in a practical sense. They know a lot, but don't know what to do with it. As teachers, you know what to do with it.

The learner's ability to retain information is startling–10 percent of what he reads and 20 percent of what he sees. One should realize that the learner has practiced "discarding" information for many years. I am an optometrist and grew up with a cliche. "Vision is the dominant factor in human behavior." Yet, this research shows that the learner retains 30 percent of what he sees and 50 percent of what he sees and hears. Consequently, the audiovisual people have come into the academic team. They have begun to combine information systems.

Anybody who works with children knows that if they express concepts in their own words they are more likely to retain the concepts than if they parrot it back to you in your words. Seventy percent of what they express in their own words is retained. Furthermore, 90 percent of what they say as they do a thing is retained. Thus, visual steering and monitoring must be involved in what the learner says. All the information systems are tapped, and suddenly we realize the "show and tell" time was pretty important after all. If *you* say it and put in into action, you are using every system available to you with which to act.

I am going to discuss briefly *three developmental phases* which are concurrent but not always sequential. There is no doubt in my mind that the two-day-old infant is capable of cognitive performance, but it doesn't happen often. On the other hand, the infant spends the first 18 months waging a contest with gravity. He is learning to move and finding out what movement does for him. I want to talk about this first phase–the *proprioceptive phase*–in which the child learns how to move. He finds out about himself and his systems. It is an impossibility in the human being, or in anything else as far as I know, to learn without movement.

The learning process is the total organizational and integrating process by which an infant, born rather helpless but dynamic, puts himself together so that he is an effective piece of machinery. It involves all of the things a child must learn to do. When you break down individual differences, and discard all of the items about us that you can individualize, you come to one common denominator–all human beings are designed for movement. In this respect we are all alike. Visually steered, appraised, modulated, corrected movement is the seed-bed of intelligence. D.O. Hebb, who probably know more about physiology than anybody alive today, says movement is the seed-bed of intelligence. This is not just my bias when I put the emphasis on vision. Movement has to be visually steered and appraised by the individual or he doesn't learn. Let me give you an example. Renshaw, who contributed more to the understanding of vision than anyone else in modern experimental psychology, said: "If you're going to teach someone to shoot a bow and arrow, and you teach him all the basic principles of how to hold the bow, how to string the arrow, and how to let go of it, and then drop a curtain before the bowman's eyes the moment the arrow leaves the bow, he will never learn to use a bow and arrow unless he has the feedback he needs in order to modulate, appraise, and correct the movement."

While my emphasis is on vision, I'm not ignoring audition. It's not my clinical bias–it's a fact that vision is the only distance receptor system we have with high reliability. I am very sure where a chair is. I am a little less sure where a noise is. Movement has to be stimulated in the infant. The infant doesn't make movements because someone else wants him to. He moves as he wants to. This is important in his organizational process because he has to start and finish it to get closure.

In the gymnasium, too frequently we say, "do as I do," and the child says, "for what?" It wasn't a movement he determined. Yesterday I saw the finest demonstration of perceptual-motor activities I ever saw because, although the demonstrator provided the materials and set the circumstances, all the movements were determined by the children. I grant you he set the circumstances, but that is our role. The minute the demonstrator gave the children a balloon, they tossed it into the air. They determined what movement they were going to make to retrieve the balloon.

In talking about movement, I recommend Smith and Smith's *Perception and Motion* (Wisconsin University Press). The first five or six chapters deal with all the philosophies, theories, and concepts of movement and perception. They show the importance of these to the individual and discuss three kinds of movement that justify movement as the seed-bed of intelligence.

The first of these survival movements is *transport movement.* I do not like the words gross and fine because they have become an either/or sort of thing instead of the description they should be. I prefer Smith and Smith's description of transport.

The child explores his new environment through movement. This is how he finds out how to get around. He can learn only by doing. In spite of all the studies of Indians who carry their babies on their backs until a certain age and then put them down to walk, it is not the same learning process. They merely walk. However, Margaret Mead's studies of the early Balinese indicate that although they did not allow a child on the ground until he was big enough and strong enough to stand up, they put him in a standing rail. His performance level was the top intellectual performance level of the Balinese and somewhere around what we would consider fifth grade level.

Let us now consider startle movements. Physical educators are not as aware of them as are the people in special education. The startle movements we usually hear about are noises to which the infant responds. Most of you have walked into a nursery or the bedroom of a sleeping infant and turned on the light. You have seen his eyes blink even though they were closed. No noise, just a light. For what reason? To alert him. Startle movements are a lot more than, "do I jump or not?" Startle movements say to the child, "Hey, I better get ready, something is going to happen." Children need to learn this.

There are also postural movements to consider. A youngster is bent out of shape at a desk because he is too unilateral–too right-eyed, right-eared, right-handed, and right-footed–the other half isn't even there. Then, when he comes to a new task, he has to spend time and energy regaining his equilibrium before he can cope with it. What I'm talking about in postural movements, and what Smith and Smith and Harmon talk about in postural movements, is the readiness to move because you are prepared to act.

QUESTION: Are you saying that we should free the individual for bilateral learnings early instead of similarity of dominance?

ANSWER: Yes! I know many people who have passed all the "dominancy tests." They are right-eyed, right-handed, and right-footed. They pick up a bag of groceries, put it in their dominant arm and don't know how to get out of the grocery store unless it has an automatic door. They have developed such a high degree of unilaterality that only half of them is performing.

I've attacked the word *dominance,* but I will not attack the word *preference* because as we develop skills for those kinds of actions that we can't do with both sides at the same time, we have to develop a preference. Cross dominance merely indicates a lack of unity and I would like to cross out of the record the word *bilateral.* What we want is not a two-sided individual. We want a reciprocal, interweaving unity and the right hand had better know what the left hand is doing, and vice-versa. That is why the kindergarten teacher said, "Johnny's going to be good in reading, he's the best skipper I've got." Although we initially laughed at the statement, we gradually began to realize that more times than not, it was correct. What the teacher was saying is that when Johnnie is hopping with his right foot, his left foot is contributing and so are his arms and torso. He is a unity. The chances are best for him because he has his mechanics organized; he's free to think.

I want a preference for certain detailed skills so that he becomes adept enough to be available and effective. Although not all children should be ambidextrous, they should have both hands available for as many things as possible.

It was a long time before people understood many of Michelangelo's notes. They thought he wrote them in secret code. After someone eventually discovered that he was mirror writing, it was realized that he could not have painted the Sistine Chapel ceiling if he were only right-handed. There were too many places he could not have reached with his right hand. All I'm trying to say is that he had these skills available to him. The chances were pretty good that when he wrote a letter he did so with his right hand, but his left hand was available when he needed it.

When I see a child who hasn't decided how to do things, I give him more practice in all the ways available to him and let him decide which way will be most effective for him. It will be determined by him anyway, unless we impose it on him, in which case, we will have trouble.

QUESTION: Is there such a thing as a visual stutterer?

ANSWER: Yes. One of the reasons we became less enthusiastic about those fancy gadgets that photograph eye movements is because we discovered we couldn't always differentiate between the ocular stutterer and the good reader who was scanning so rapidly he was jumping all over the page to get the important information. This is a level of low skill in my thinking. What are we after in movement? Efficiency. How do we get the most done with the least effort. This is what movement is for.

QUESTION: What is your opinion of the work of Carl Delacato and his associates?

ANSWER: Without doubt, they have made a contribution and have improved some children. However, most of their philosophy is questionable. I know Carl Delacato very well. Years ago I said to him that it is impossible to stimulate one hemisphere of the brain by covering one eye because each eye is represented in both hemispheres. He said, "Oh, is that true?" I said, "Certainly. Look at neurology. There's an optic chasm where one half of the retina goes to one hemisphere and the other half goes to the other hemisphere. Consequently, when you cover one eye, you are not cutting off one hemisphere." He said, "That is interesting, but it doesn't fit our philosophy." Now you understand why I react the way I do to part of what they are doing. Current neurological literature raises the question of whether there is a dominant hemisphere in the brain. Habit patterns are set into adults, and undoubtedly most adults get a speech center on the left side of the brain. That doesn't mean it is dominant speech; it means that that is the way it happens. Many people who have cerebral hemorrhage in the speech area go right on talking. I know a youngster who had one full hemisphere removed and you wouldn't know her from any other child. The operation was performed early enough so that she compensated with what she had. She *does* have a dominant hemisphere!

There is no doubt that Delacato has successfully helped some children. Much of his philosophy is neither neurologically nor physiologically sound; it serves as an explanation for his benefit.

We chose the word *preceptive* very carefully. A precept is a rule or principle imposing a standard of action or conduct. Action or conduct is movement. These are movement words–"action," "conduct." After 30 years experience in clinical practice and in teaching people how to use their eyes better, I was startled when I saw a double page magazine spread that said across the top, *"How can you be certain your child is seeing what he is looking at?"* I immediately said, "How can I be sure he is hearing what he is listening to or feeling what he is touching?" The point is that these are the systems by which the child finds out that he lives in an environment, that he uses an environment, and eventually becomes the master of his environment, if he is going to be an effective organism. Too frequently, we assume that if his vision is 20-20, it was available to him. Suddenly we realized we had to go back and help these children find out how to use these systems. There is no possible way that humans can use only one system in isolation. There is no such thing as visual perception, auditory perception, or tactile perception. There is *perception.* These are the systems by which perception is developed. When you use the phrase *visual perception,* you are trapped into saying that there is only one system that perception depends on.

QUESTION: Where does the light go that enters your eyes? Does it go to the neurological nerve center?

ANSWER: Most of it is absorbed. Much of it is reflected. All it does is set off electrical signals. It is translated into electrical energy and that's all.

QUESTION: Does it go into your muscles?

ANSWER: Yes, 20 percent of it goes to your back; it doesn't even go up to the brain. Twenty percent of what the retina receives goes immediately to the postural muscles in your back. It doesn't even go upstairs to the seeing mechanism.

The preceptor stage is the action stage by which the child finds out about his world. In the proprioceptual stage, he was finding out about himself. A child uses his action systems to serve his purposes. Adults frequently say to children, "Look at this picture" or "Listen to this tube." Unless the child says, "yes, I will because it's of use to me," he may not do it. The infant only uses systems that serve his purpose.

The phrase *manipulative movements* better describes what people do than does the phrase *fine movement acts.* Manipulative movements comprise all the action systems that enable a person to explore the contents of his world. I have mentioned manipulative hearing, seeing, saying, touching, tasting, and smelling only because these systems are the most available to us as we guide children. There are other systems, such as the biochemical systems, but we don't known what to do with them as yet. In fact, the newspapers have been printing articles lately about a drug called ritolin. Almost all hyperactive children are receiving it carte blanche because it makes them sit still. If they sit still, they supposedly learn better. Any drug that numbs the motor system also numbs the thinking system because we are dealing with a totality. According to one report, all of the basic original research on ritolin was done on a mere 60 children. Then a pharmaceutical house advertised it. In my opinion, this area needs much more research.

Seeing, saying, touching, tasting, smelling—how many of you are giving children experience in tasting and smelling? Probably the first system a child uses is smelling. My grandson tasted the difference between me and his mother at the end of five weeks. I am quite sure he could also smell the difference between us. If these systems are that primitive, we ought to help children learn to use them better.

No child ever learns to read just because he creeps or because he graduates on a walking beam. What are learning and skill? Skill is the *end result* of learning how to discriminate the *just noticeable difference (J-N-D)* that counts. The difference between Jack Nicklaus and me is many J-N-D's because he feels some J-N-D's I don't even know about.

When you help a child learn to discriminate the J-N-D's in these systems, he is far more available to the teacher; he is far more likely to discriminate the difference between *then* and *them.* This is a minute difference, not only in sound but also in the appearance and movement it takes to make it. But the minute J-N-D's are of real significance.

We know that by helping children learn to make discriminations of how many steps it takes to go from here to that door, as compared to how many steps are needed to go from here to the third panel of that wall, we help them in discriminating many other differences. Reading skill is not an automatic result. There still has to be a reading teacher to teach them the difference between *then* and *them* and to help them learn it. When they bring these auditory, visual, proprioceptual, and manipulative J-N-D's to the tasks, they are "readier" children. There is really no such thing as a perceptual problem. The problem shows up in perception, but the problem stems from one of the systems not providing the information it should. There is a hole in the concept. Without any doubt, the more you assist children to build skill in J-N-D's, the more perceptive they become.

What is a perceptive individual? He reads; he's aware; he interprets more signals and information, and comes to the best possible answer. As I said earlier, there is no such thing as a visual perception. There is perception, but total perception of the texture of a wall, deemed by looking at it, depends on other information you possess as well.

The child who has not had the chance to learn all of these things through movement will never reach his potential as a human organism. He needs some frame of reference of movement within himself, or because of himself, to verify all that he gets from there on. Perception is a product—the end result. Perceptual problems will not be cured by attacking the perceptual deficit any more than reading problems will be cured by remedial reading. There are very few remedial reading programs that have ever been successful under that general category. This is mainly because what was done was to repeatedly practice the difficulties the child was already having. We have to go back to the underlying systems—all learning is movement.

Physical education teachers can do more to eliminate or prevent reversal problems than anyone else. Reversal problems are direction problems or sequence problems which include, imply, and depend on movement. I have seen reversal problems "cured" in large groups of children by physical education and music teachers. They taught children to square dance. It only takes one or two alamand rights when you should have alamanded left and one or two nose to nose confrontations with the wrong partner before a child realizes the meaning of directionality. We must realize that left to right is cultural, not biological. This is my right hand only because culture says so. This is my left hand only because that is the way we communicate. As far as my physiological, biological system is concerned, these hands are a matched pair; they should be unified.

If you can help children learn what the direction of a movement is, you will contribute more to their ability than the classroom teacher, who strives to develop direction and sequence only in the symbol. If children learn it down in the machinery that tells them, "Ah, yes, I can feel it," they will always be more sure of it.

QUESTION: Would you comment about the effects of television? There are many things that worry us greatly about television.

ANSWER: Television has dynamic possibilities. The problem is its passivity. There is too little participation. In my laboratory, we raised five children. We raised three before T.V. and two after. When T.V. came along, I saw to it that the two boys who came after T.V. were stimulated to participate. Charley did not have to be stimulated. He changed his costume for every show. When it came to a cowboy show, he put on his guns and his hat. When it was Superman, he draped a towel over his back and put on his long underwear. He participated! Today, there is research showing that kids learn how to sit hour after hour and learn *not* to pay any attention to what is on the screen. Researchers are running E.E.G.'s while children sit there in front of T.V. and the results indicate that these children are so passive that they're not even paying attention. You can almost say they are learning not to see or look. This is bad. Many things here need to be examined carefully.

QUESTION: How do I get the most done with the least effort?

ANSWER: That is perception. How do we combine or contrast systems? I could bring out a certain set of blocks and drive you crazy. I make them on purpose, not for children. Certain things about these blocks would confuse you until I rearranged them in a certain way. There is a series of blocks of different sizes and I ask you to tell me which is heaviest. You usually say, the biggest one, of course. Well, I sneaked in some weights and so you pick up the blocks and say, "The littlest one is the heaviest. You must have weighted that the most." Actually, these blocks weigh the same. Nobody believes me until we put them on a postage scale because every one of the sensory modalities is misled. One makes conclusions on the basis of what it looks like or what it feels like.

QUESTION: Whatever happened to D. B. Harmon's ideas concerning classroom furniture?

ANSWER: What always happens when it costs more to do better? When they could put in the bleachers at the football fields for the money they saved on the cheaper desks, you know what got done, don't you? So they do not even make a decent desk any more.

QUESTION: Why didn't they do more research?

ANSWER: Because the school board wouldn't buy it.

QUESTION: I've heard that the listening curve of children has decreased and that the talking curve has increased. Would you say this is good or bad?

ANSWER: It's bad because there are more parrots and less participants. And this is part of what television does. They babble what they hear and don't listen to what they are saying. I have a strong conviction that the auditory system was not given to us primarily to listen to each other or to listen to music. An auditory system was given to us primarily to monitor our own noises. The baby knew whether he was making the right noise to get toilet care or food, and our children are not making those discriminations any more. They are listening and imitating without monitoring their own noises.

PART II

PRACTICES - ACTION AND INTERACTION

> *. . . you have seen a lot of activities here; with your knowledge and common sense you can make some choices to help children develop.*
>
> **STEVE KLESIUS**
> **Cincinnati, 1970**

Editor's Note:

The reports of the action programs are based on written material prepared by the various speakers. Many of the programs were visual presentations and it was impossible to present a complete coverage of the materials.

Video-tapes of several sessions are available through the *Physical Education Division Video-Taping Project* under the supervision of Chalmer Hixson, Department of Physical Education for Men, The Ohio State University, Columbus, Ohio. Write directly to him for further information.

Information concerning the *Differential Education Project* can be obtained by contacting Mr. Robert W. Bess, project director, 235 E. Thirteen Mile Rd., Madison Heights, Mich. 48071.

PERSPECTIVES FOR ACTION PROGRAMS

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My task is to set the stage for reviewing and analyzing action programs, to raise questions, and to point ahead. When new dimensions are being explored, a wide variety of programs usually develops. The perceptual-motor field is no exception. This writer has been a member of public school and university staffs for more than 30 years, and has seen in the last decade as much, if not more, interest and diversification in the perceptual-motor field as in any other field.

Currently, programs range from emphasis on elementary physical education programs for all children, to control and experimental groups selected because of functioning problems or deficits. Some programs are developed and supervised by the physical educator, others by elementary principals or curriculum supervisors. Programs may be conducted in a gym, classroom, specially equipped room, or a clinical setting. Some are an integral part of the daily schedule, others are quite separate. Some involve a multidisciplinary team, while in others, one person "runs the show." Screening, selection, and research vary as much as personnel and programs.

As society becomes more complex and costs soar, every major institution that deals with human beings is examining more closely its goals, methods, and results. Interest in the perceptual-motor area coincided with the advent of federal funds. These funds provided a great impetus for materials and personnel. Perceptual-motor was considered innovative—a key word for funding. As the time for perceptual-motor projects expires, and as local districts begin picking up the tabs, many questions are being asked, calling for concrete evidence in research.

Schools are beginning to take a serious look at the deficits children have when they begin school. This involves deficits of the learner, of the school program, and of the learning environment at home and in the community. The concept of readiness is being re-examined. Research regarding sensory deprivation and the possibilities of sensory stimulation have been almost traumatic, even for those who consider themselves knowledgeable. Investigations at the University of Oklahoma have revealed that just having a mobile over a crib may make as much as 52 days difference in reaching. Experience is now said to foster structural change. Theorists are getting closer together as research not only reinforces the maturational aspects, but also stresses the way experience facilitates advancement. One no longer tolerates arguments of either-or, but further research is needed to better understand maturation and to improve experiences. Development involves a combination of factors operating in complicated ways. Because of the highly complex nature of the developmental process, physical, social, intellectual, and emotional components are not separate and independent—they are functionally related to one another. Some of these components develop without any special practice or teaching by adults. Significantly, when the environment imposes delays, deficits may interfere with later learning. One may work on the deficits, but he must always return to the total movement and functioning of the child, because development proceeds as an integrated network. How do the programs handle this?

New ideas and methods always bring a struggle with problems. Severe problems are easier to see and often yield more dramatic solutions. Early perceptual-motor programs reflect a tendency toward preoccupation with dysfunction.

A major concern has been, and still is, dysfunction versus the total physical education program. Some were afraid people would think "that's physical education." Well, isn't it part of it? The problem is not one or the other. Each has made major contributions to the other. It's not either-or, but how they are related. What is the role of the physical educator? Remedial work in many areas has for years centered on dysfunction. As important as remediation is for some, it is an endless task, often it is just a postmortem. It may even be too late to plan an effective program. This is happening in other fields also. Consider mental health. For years we have been building more and bigger institutions. When one out of seven persons needs some kind of mental health service, the day of reckoning comes. As someone said, "The bodies are being thrown in the stream faster than remedial programs can pull them out." The only solution is preventive programming. Community mental health is now the major concern. The movement is from hospitals and institutions to people! It is encouraging to see physical education people interested in developing specialists for the handicapped, but the major emphasis needs to be on prevention. We need both. To work successfully in the area of dysfunction requires some specialization. The increase in number of children who need help raises the question of whether our assessment is improving, or whether cultural factors are creating more problems.

During the establishment of some of the early programs, it wasn't uncommon to find a person, perhaps even a physical educator, who visited a program, returned home, and set up one of his own almost overnight. This "30-day wonder" type of approach caused concern then and now. When the AAHPER Perceptual-Motor Task Force in 1967 decided to emphasize development as opposed to remediation, the purpose was not to play down remediation but to provide opportunities for gaining more basic knowledge in child development. Child development is a specialty. For those with background, workshops and institutes are an excellent way to update, revise, and keep in touch with new research. For those starting, a full year's work in child development taught by a multidisciplinary team is something we should be striving for.

Much has been said and written about the preschool years as being a critical period of development. Concern has been expressed over all children having the benefits of movement efficiency essential to growth. One hears that the younger one gets at it, the easier difficulties can be overcome, and the more efficient the movement. As educators move into the preschool years, the importance of parent education looms large. The parent *is* the major teacher. The learning environment *is* the home and the block. In a community one sometimes sees several different parent programs; I plead for coordination of effort and programs. It will take research on the problem, awareness of solution, and organization of people.

Research indicates preschoolers can be taught to use the various sensory modalities more effectively. I would like to underscore *various.* Earlier, much of the emphasis was on visual-motor; now we're getting much more input on auditory, kinesthetic, and tactile modalities.

The concern is often expressed that some programs are too stereotyped and divorced from cognition. As we analyze programs, one question is, "What opportunities are provided for the child to think, to make choices, to innovate?" How varied are the materials?

What about norms? What really are "true developmental patterns?" Does anybody know? Does every child go through the pattern in a specific order? Evidence supports the claim that culture may change the so-called normal sequence. The Dayton research found that children from deprived areas did well in gross motor activities but had difficulty on the fine motor tasks. In the more affluent areas, children did better in fine motor tasks and had difficulty with large motor activities. It is important to know the life styles of the culture or subculture. This is also true for longitudinal research.

Another concern is transfer. This has long been with us in many fields of research. At one time some claims were very specific, i.e., that training in perceptual-motor skills led to improvement in reading and writing. Now one hears more about academic readiness, learning, etc.

A 1970 issue of the *Journal of Educational Research* was devoted entirely to reading research. Some important points made were:

1. Research has clearly shown that children with reading problems are slower in perceptual development than normal readers.
2. There is evidence that some specific neurological impairment and reading skills are linked in poor readers, but no cause-effect relationship has been proved. This link is not as specific as some try to make it, nor can it be disproved as completely as others would have us believe.
3. Two articles referred to the use of the Frostig Test of Visual Perception. Some children showed superior achievement gains on the Frostig on post-testing, but these gains didn't seem to transfer to school related tasks, as there was no significant difference in experimental and control groups on the Lee-Clark, Metropolitan, or Peabody Tests. Other authors stated that training in the Frostig produced significant gains in reading. One article pointed out that children with severe reading difficulties (though a limited number of subjects) made substantial progress in overcoming these difficulties.(4)

At the 1968 Task Force Meeting, Dr. Maslund, in regard to transfer, stated: ". . . a possible exception was observed in a group of severely retarded readers for whom perceptual-motor training appeared to enhance reading performance."(1) Severely retarded readers present an awesome challenge to educators. A valuable clue here needs further probing. The mistake of early programs has been if it is this good for one, let's get everybody in. There is yet much to be done, and selection research is desperately needed.

Prescriptive teaching becomes a big challenge in all education. It is a new term for an old hat. Yet, as diagnostic ability improves, demands for prescriptive teaching increase. Research is giving clues that this is true in physical education, but the process and roles for various personnel are still being researched.

We have reached a frustration level. We have diagnosed more than we know how to program, the nitty-gritty comes as we integrate our skills. Prescriptive teaching is the output of our input! One has to understand *why* as well as *how*.

There is still some question regarding the validity of the instruments and concern that they be made more objective. However, prescriptive observation is a key factor. This is learned and one doesn't hear much how this is being built into programs. Video-action programs are good labs, but prescriptive observation is best learned under proper supervision. This area needs immediate attention.

There is, too, the concern that more is claimed than research actually suggests. However, there is an urgent need for openness, interaction, and cooperation that will encourage schools to do more action research within the school setting. This is needed to go along with the controlled laboratory type of research. Many educators are not specialists in research design, but are anxious to have other professionals work with them. Accept their efforts, be glad they are willing to try, then help refine and innovate. These last few years have seen a lot of give and take. Dr. Hanson summarized it well when she said, "There is much dialogue, accord, and controversy about content, method, and terminology." (2) The openness and increased communication that is developing offers much promise.

Our challenge, then, as we look ahead is effective multidisciplinary cooperation and combined research. This is a complex area. None of us can go it along; we need total team effort. The physical educator is a specialist but needs benefits of physiological, psychological, and neurological input. I recall some of the comments made by specialists in the 1968 Task Force when Dr. Muriel Sloan emphasized the role of kinesthetic perception in concept formation and learning. Dr. Cohen noted the minimum energy expenditure of different tasks and the question of stress. Dr. Berson wanted more opportunity built into play – trees, ladders, tunnels, pools, sand, wheels, and outdoor activities. (1) Take a look at indoor and outdoor environment and question whether movement is divorced from cognition. Resources and materials along with a good environmental playground are not restricted to the gym, lab, or classroom. What are we doing to integrate child's total experiences?

A.E. Wall states that, "Total team effort has been one of the greatest benefits." (5) We've been sharing ideas. Now share the theoretical constructs upon which perceptual-motor activities are based, and from these develop new activities which may be evaluated by empirical experience and research techniques.

Many issues have yet to be resolved. What is the best program for all children? What children need specialized prescriptive teaching, and how long, by whom, and where? How much do we know about early life styles? Is this taken into account in screening and evaluation? Can we begin to spell out more concretely the role of team members?

Longitudinal research is needed. The people willing to share action programs with us are to be commended. In the following presentations you will have an opportunity to view a clinical model, a model where an elementary principal assumed leadership, and a model where a curriculum consultant provided leadership. The physical educator plays different roles in these models. Let's exchange ideas, welcome constructive criticism, discuss innovations, and express our thanks to schools willing to research an idea.

Sometimes the knowledge of what something doesn't do is as important as what it does do. Let us examine present programs in terms of the setting, theory, roles, research and then consider next steps. It is true that we still have far to go in establishing the validity and reliability of much that is happening. The rapidly growing professionalism is real progress. We're off the defensive. We're ceasing to use names in programs. We're dealing with concepts. Ideas and programs are placed in the marketplace of discussion and critique. I see a much more exciting decade just ahead.

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PROGRAM FOR SENSORY-MOTOR DEVELOPMENT AT THE MARIANNE FROSTIG CENTER OF EDUCATIONAL THERAPY

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The Philosophy Basic to the Program

All newborn infants are faced with the same enormous task. They must develop from a helpless, passive, totally dependent organism into a self-sufficient, self-directing, independent human adult. To do so, a child has to develop many abilities, the growth of which depends upon the interaction of his inborn human characteristics (his native endowment) with his environment.

Controlled movement, language, perceptual skills, and higher thought processes need to emerge and be refined, diversified, proliferated, and perfected so that the child can learn to communicate with the environment and to comprehend, judge, and evaluate his own actions and those of others. The development of these abilities follows a definite sequence. During successive phases different abilities show maximum growth. For instance, language develops maximally between 1½ and 3½ years of age and perception between ages 3½ and 7. These phases are preceded by the maximum development of sensory-motor functions, which begins after birth and continues until about the age of 18 months.

The phrase "sensory-motor functions" denotes the child's mode of exploration of himself and of the world around him through simultaneous use of his sense modalities and movements. The infant seems to try to take in the world with all the senses and with movements simultaneously. He explores an object by handling it, licking it, throwing it, banging it, hiding it, retrieving it, changing its location, and making sounds with it.

Through these simultaneous activities the child develops four distinct groups of sensory-motor skills. The first two groups may be termed awareness. The infant learns to recognize many features of his environment, to become aware of the outside world. He also becomes aware of himself as distinct from his environment. The third group of skills are the motor skills. They include the child's ability to change his body position from lying to sitting, from standing to kneeling, and so on, as well as the ability to move in space–to crawl, walk, run. Finally, the fourth group of skills includes the child's ability to change the form and placement of objects; the child learns to grasp, hold, release, squeeze, pull, tear–to manipulate in various ways. Mastery of these four sensory-motor skills is the child's first step towards independence. They prepare him for adjustment to his environment and for future learning.

A training program in sensory-motor skills should therefore involve several kinds of activities. First, there should be education in gross motor skills. This training is usually called movement education or physical education. In addition, there should be manipulatory activities, such as arts and crafts and shop work; for the young child, exercises in sensory discrimination should be included.

I will restrict myself to a discussion of certain aspects of movement education, namely, awareness of self and environment and development of gross motor skills. It should be kept in mind that we will be covering only a small part of the total sensory-motor training that each child should receive. The activities recommended by Montessori, training with perceptual programs, sandbox play, exercise in the swimming pool, ice skating, drawing, painting, and many other activities are all effective forms of sensory-motor training and may have a part in the overall training of sensory-motor skills.

Goals of the Program

Movement education is here defined as a form of sensory-motor training. Sensory-motor training is sometimes thought of as being primarily an important part of remedial education, and totally different from physical education, which is supposed to be part of the school curriculum. But all movement is best understood as sensory-motor activity. Conscious, controlled movement depends on sensory input; therefore, all movement education can be considered to be sensory-motor training, whatever form it takes. The teacher needs to study both the sensory and the motor aspects of movement, and these should also be considered equally in educational programs.

Controlled movement depends on awareness of the location of the different parts of the body and upon perception of their change in space. We often stress visual-motor coordination so much that we forget the importance of other sense modalities. A blind child can walk, run, ride a bicycle, or learn to ride a horse, but no one can learn controlled movement without somasthetic input. Body awareness is therefore a central concern of movement education.

We must also be aware of the relation of other sensory input to movement. During movement education a child is asked to respond to auditory stimuli, principally to the directions given by the teacher. Movement education, therefore, employs equally three sensory avenues: kinesthetic-tactile experience, auditory stimulation, and visual stimulation. The child learns to react with appropriate movement to what he hears, sees, and feels. He becomes more keenly aware of outside stimuli as well as of those emanating from his body. Heightened awareness and efficient reaction to outside stimuli are objectives implicit in physical education, but they are made explicit in movement education, which includes awareness as a main objective.

The goals of movement education include the usual goals of physical education—health, a sense of well-being, and physical skills—but they are broader. The movement education teacher considers all developmental aspects—for example, the relationship of sensory experience to movement. He is concerned with awareness of space, awareness of time, body awareness, and awareness of the spatial relations of the body to both moving and stationary objects.

The emphasis on awareness does not mean that movement skills per se are not emphasized also. Movement skills, or as they are called, the attributes of movement, also need to be defined and trained. Many factor analytic studies of movement skills have been reported (8), and most agree that the motor abilities that can be isolated are coordination and rhythm, flexibility, speed, agility, balance, strength, and endurance.[1]

The attributes of movement are defined as follows:

Coordination is the simultaneous and coordinated use of several muscles or muscle groups. It includes the ability to cross the midline of the body and to coordinate asymmetrical movements. Asymmetrical movements are those in which body parts of each side of the body are moved simultaneously but in different directions, as in reaching one hand forward while stamping the leg of the other side; making a linear movement with one limb and a circular movement with another on a different side; or moving different body parts simultaneously in different rhythms. Rhythm denotes a recurring pattern, and rhythm of movement depends upon coordination. Poor coordination leads to spasmodic, unbalanced movement with poor synchronization.

Flexibility involves the ability to move parts of the body easily in relation to each other with a maximum range of joint extension and flexion. Tumbling, for instance, will increase the flexibility of the trunk forward but not backward; swimming will increase the trunk flexibility backward but not forward.

Speed refers to the time span between the beginning and end of a movement. Speed does not refer to reaction time.

Agility is the capacity for fast reaction in body movement. It refers to the ability to initiate movement, change direction, or otherwise adjust position speedily.

Strength refers to force exerted either with the whole body or with parts of it. It can apply to specific muscle groups, as in gripping an object or to the whole body, as in lifting a weight. Many exercises which do not seem to be particularly related to strength do in fact strengthen certain muscle groups; jumping, for example, strengthens the leg muscles.

Balance refers to maintenance of position with minimal contact with a surface. The term "static balance" is used when the support is stable and the person is not in locomotion. Standing on tiptoes is an example of static balance. Dynamic balance involves the ability to position on a moving surface, as on a rolling ship, or while moving the body with minimal support, as on a balance board. Balance also refers to supporting something minimally without letting it fall; the juggler, for instance, can balance a stick on his nose.

Endurance. There are two aspects of endurance: muscular, or the ability to persist in physical activity and to resist muscular fatigue; and cardiorespiratory, referring to the ability of the body to utilize available oxygen in the same efficient way. Training in endurance requires extended sustained exercise and has to be fairly

(Text continued on page 76.)

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[1] Although most of these studies have been made on adults, clinical experience suggests that the same factors apply in children.

TABLE 1[2]

Factors in Human Movement and Physical Education Programs, by Authors

Attributes of Movement	Guilford[1]	Nicks and Fleishman[2] (Summary of 78 Studies)	Mosston[3]	Kephart[4]	Frostig and Maslow
Coordination and Rhythm	*Coordination* Gross body Hand dexterity Finger dexterity	*Coordination* Gross body Multiple limb		*Coordination* Gross motor Eye-hand Integration of both sides of body	*Coordination* Across body axis of different muscle groups simultaneously *Rhythm* Jerky vs. smooth movements Synchrony prerequisite (see Doll[5])
Speed and Agility	*Impulsion* General reaction time Tapping Articulation speed *Motor Speed* Arm-Hand-Finger	*Speed* Limb movement Running *Agility* Change of direction during movement	*Agility* Takeoff Change of posture during movement	*Receipt and Propulsion Contact:* Reaching, grasping, releasing Manipulation to obtain information	*Speed* Continuous movement in space Running *Agility* Initiation of movement Change of direction
Flexibility	*Flexibility* Trunk Leg	*Flexibility – Speed*	*Flexibility* Spine and pelvis Shoulder girdle Bending forward and sideways)	(Kephart uses the term flexibility for what is here defined as agility.)	*Flexibility* Maximum extension in trunk and limbs Rotation of joints

Strength	*Strength* General Trunk Limbs	*Strength* Explosive Dynamic Static	*Strength* Shoulder girdle and arms Upper back Abdomen Legs		*Strength* General, specific muscle groups
Endurance		*Endurance*			*Endurance* Sustained movement over time (see Cureton[6])
Balance	*Static Precision* Static balance Arm steadiness *Dynamic Precision* Dynamic balance Arm aiming Hand aiming	*Balance* Static Dynamic Object	*Balance* Movements on ground Movements on apparatus Movements while supported by another person	*Balance* Maintenance Dynamic relationship to gravity	*Balance* Static Dynamic Object

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[2] Marianne Frostig and Phyllis Maslow, *Movement Education: Theory and Practice* (Chicago, 1970), pp. 32-33.

vigorous; it is, therefore, not recommended for children under eight or nine years of age.

We have discussed two very broad groups of objectives of the movement education program: the development of awareness and the development of movement skills. But movement education takes into consideration the total human being and all aspects of his development. Receptive language is developed as the child learns to react to the teacher's directions. Memory is influenced when the child learns to remember a movement sequence. When the teacher gives verbal directions, the child learns to remember what he hears; when he copies a movement sequence, he learns to analyze and to remember visually the sequence he has observed. He learns to integrate auditory, visual, and kinesthetic stimuli, and to respond to them.

Movement education can be used to develop the child's problem-solving ability, to help him seek creative solutions and new avenues for self-expression. It can be used to develop such basic abilities as paying attention, concentrating, and sustaining effort. Most significant and crucial of all, in my opinion, are the emotional and social gains which can accrue from movement education. In our time of unrest, hostility, uncertainty, and lack of understanding, such gains are the greatest importance for the individual and the group. Well conducted movement education can develop in the child an awareness of other children, the ability to cooperate and act in harmony with a partner or a group, and a greater sensitivity toward his fellow human beings.

In addition to helping all children in these developmental aspects, movement education has great value for the remediation of learning difficulties. Movement education is of enormous importance for children with learning difficulties, whether they have motor or other adjustment problems. Children who lack body awareness, including those with difficulties in laterality and directionality, those with difficulties in understanding language, those with perceptual deficits, or those who are hyperactive or hypoactive, usually improve with the help of movement education, which takes such deficiencies into account.

Description of the Movement Education Programs

At the Center, certain exercises have been devised which focus on training movement skills; others focus mainly on promotion of body awareness. This does not means that in practice a strict separation exists between these two aspects of the movement education program. All exercises which are designed principally to promote body awareness will also promote better movement skills, and all exercises designed to develop movement skills will also develop body awareness.

Laban (5), Dalcroze (1), and many contemporary American educators, including Mosston (7), have expressed the opinion that training in basic movement skills is an essential preliminary to the use of movement for optimum creative expression. The child has first to improve lagging skills before he can acquire a movement vocabulary. Expressive movements derive from the child's natural movements—his skipping, hopping, running, turning, stretching, and curling—but some children lack the necessary coordination to hop or skip or run, or the necessary balance to jump or walk on tiptoes. They may lack the agility to roll over or get up from a sitting position without using their hands, or they may lack the flexibility which makes possible a greater range of movement. Preliminary training in the basic attributes of movement is therefore essential.

A teacher of children who have difficulties in movement must also be aware of emotional factors that may inhibit the acquisition of movement skills and expressiveness. Many children are too anxious or angry to interact or perform in a group with others. Others are too self-enclosed or insecure to use their bodies confidently in space. Such children may initially resist movement education that is conducted in a group and may need to be worked with individually until they gain confidence.

The teacher who works with children who deviate from the norm needs to realize how often they have experienced failure. Any expression of discomfort or sign of anxiety must be reacted to at once because whatever the difficulties of the child, whatever the official diagnosis, such children have one thing in common, their fear of failure. They dread nothing more than failure; they thrive on nothing more than success. What is true of atypical children is also true, though to a less extreme degree, of "normal" children. An experienced movement education teacher will, therefore, always try to use the program to provide a feeling of success and well-being and to prevent anxiety and failure.

To try to help less experienced teachers provide a well balanced program which takes into account all aspects of the child's development, we have developed *Move-Grow-Learn* (2), a guide, and a set of cards containing instructions for exercises. The cards are color coded according to the movement skill that is being developed and the focus of the exercise, whether it be creative movement or body awareness. By using exercises on cards of different colors, the teacher ensures the use of a balanced program. The differentiation also enables the teacher to select the appropriate exercises when adapting the program to the specific needs of children with movement difficulties. As a teacher becomes familiar with the exercises and accompanying guidebook, he will be able to conduct the program with less reference to the coded cards.

A balanced and varied program is necessary, even when it is weighted in a particular direction to meet individual needs. The ultimate goal should be self-expression and self-direction, not conformity. A teacher has to prescribe certain exercises, but he must allow the children to solve, by themselves, problems which he sets or which the children set for themselves. A child should be helped to explore various movements by himself and with the group. He should learn to remember movements and to arrange them in sequences, combine them into patterns, and use movements which flow imperceptibly into each other.

Free creative movement is concerned with the relationship of the body to space. It helps the child to explore his personal space and the common space he shares with others, and to use both to the best advantage. While he creates movement sequences, the child learns to change directions in space, to move forward, backward, and sideways, to make different patterns on the floor, both running and walking, and to explore horizontal and vertical directions by jumping, crouching, curling, and rolling. The child should also be helped to experience the varying relation of movement to time; he should learn to move both slowly and quickly, to change speed, and to move in different rhythms with flowing as well as with controlled movement. The child should also learn to experiment with the dimensions of weight, feeling the contrast between heavy, strong movements and light, gentle ones.

A great deal of work is done at the Center in relation to gravity. A child learns to become aware of what part supports the rest of his body as he lies or stands, rises up on tiptoes, walks on all fours, hops on one foot. He learns to change the support of his body consciously from certain points to other points without losing balance. He also learns to vary the shape of his body, changing it, for example, from a round ball to a twisted screw, or from a spread out "wall" to a pointed "arrow."

While each dimension of movement should be explored separately, the child should also learn to combine movement variations from several dimensions. For example, he should be able to think about varying a movement in time and speed while at the same time executing a distinct floor pattern. It is necessary for children to become acquainted with the dimensions of movement and their combinations if they are to acquire an easy mastery of an extensive vocabulary to be used in creative movement.

Rudolf Laban (4)(5)(6) has developed a comprehensive vocabulary of body language,

TABLE II[3]

Space personal common	**Weight** heavy, forceful light, gentle	**Air Patterns** patterned movement in the air of various parts of the body
Time slow fast sudden sustained accelerating decelerating even uneven	**Gravity** points of support in various positions **Shape** wall screw arrow ball	**Partnership** alone with one partner in a group
Flow controlled free	**Level** high low intermediate	

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[3] Cf. summary in Frostig and Maslow, *Movement Education*, pp. 75-79.

many of the terms of which appear in Table II. Movement sequences can be developed in a variety of ways to help the child acquire awareness of his body and move harmoniously as a consequence of this awareness.

Laban (6) has said "... the central problem in achieving efficient movement is, in our opinion, the development and safeguarding of the sense of proportions of the factors of motion, weight, space, and time, and their controlled flow."[4]

Working alone, with a partner, or in a group, the child learns to express his feelings through movement. He learns to enjoy the comradeship of working together. He becomes more actualized as an individual, and what he does becomes meaningful.

One of the ways to stimulate creativity is mimetic play; the children, for example, may be asked to run as lightly as a fairy or to grow and stretch toward the light like a flower opening its petals. At times, stories can be acted out by the children.[5]

The Center

I have been asked to write about the philosophy and organization of our Center, so that the role played by movement education can be seen in proper perspective. The Marianne Frostig Center of Educational Therapy is a nonprofit institution that has three main goals–service, professional training, and research in the field of treating children with learning difficulties.

> Learning difficulties may be due to brain dysfunction, environmentally caused emotional disturbance, or to an apparent lag in development without known cause. Usually both causation and symptomatology are multiple, with emotional disturbances a frequent factor in the total clinical picture. Moreover, a child's problems do not affect him alone, but involve the entire family; therefore, parents often need psychotherapy. Nearly always they need advice on how to help their handicapped youngster, and support in carrying it out.
>
> To meet these difficulties, the Frostig Center has developed a multidisciplinary approach, which brings together in one place the services of psychiatrists, psychologists, social workers, and educational therapists. Each child is provided with a comprehensive evaluation and treatment program, which covers all developmental areas and takes into account the needs of the whole family. The remedial training programs are precisely geared to the individual child's test results.
>
> The professional training programs of the Center are designed to acquaint educational therapists, psychologists, and social workers with the special needs of children with learning difficulties, and with the appropriate evaluative and remedial measures. The research is concerned with the construction of evaluative instruments and the development and assessment of educational and psychological treatment methods.
>
> The overall concern of the Center is with the preconditions of learning: the developmental abilities which enable a child to achieve success in school. Remedial techniques are used to develop abilities which are lagging. Subject matter and academic skills are taught in such a way as to develop them.
>
> The aim of the remedial programs is to enable each child to function at his optimum level and enter, or return, to public school competent to succeed to the best of his ability with whatever method he may be taught. To achieve this remedial goal, the Center concerns itself not with a single remedial technique, but with a great variety of teaching and therapeutic techniques, and not with one facet of a child's development, but with every facet.

The Children

Approximately 200 children are enrolled at our Center; about 60 percent of these children are enrolled for full-time school and 40 percent for tutoring. All of these children suffer from learning difficulties. Diagnoses include brain damage, learning difficulties of unknown origin, adjustment reaction of childhood, and behavior disorder, but the children are not grouped according to their etiological or descriptive diagnosis. They are placed with the teacher and children with whom we expect them to make the best adjustment. The decision might be influenced by such factors as sharing similar problems with other children, having a friend or friends in a particular group, having a liking for a particular teacher, or sharing a certain interest with him. If a child has no father, or an inadequate father, we usually arrange for him to enter a group with a male teacher. The age range in a group is about three years. The school is ungraded, but the parents of each child receive a statement of accomplishment measured by the usual grade standards.

During the initial evaluation, we try to get a preliminary understanding of the developmental level of each child in each of the main groups of psychological functions: sensory-motor abilities, visual and auditory perception, language, thought processes, and social and emotional development. In addition to tests and screening devices which evaluate each of these areas of development, achievement tests are given.

Most of our children are in the average range of intelligence, but a few have had to be transferred to classes for the mentally retarded. The average I.Q. of all the children was calculated a few years ago. It was 97.6, which is probably considerably below the average found in the socioeconomic range of their parents.

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[4] *Ibid.,* p. 16.

[5] *Ibid.,* p. 81.

Testing is only a part of the evaluation. A clinical interview with the parents, observation of the child's behavior, and a clinical interview with the child are considered equally important.

The following case history will illustrate how each child's educational program at the Center is based on the results of his total evaluation (See Table III). All of the children have movement education, and those like Robert with disabilities in sensory-motor functioning, have a special remedial program of movement education adapted to their individual needs. But even in the case of children with sensory-motor disabilities, the movement education is embedded in a total program which takes into account the child's abilities and disabilities in every area of psychological functioning. Each child's test results are plotted as Robert's are on the accompanying table.

When Robert was 10½ years old, he was referred to us by a psychiatric clinic because of severe adjustment and learning difficulties. Although of average verbal intelligence (WISC V.I.Q. 109), he was considerably retarded in school achievement. His behavior was bizarre. He would sit and rock for hours. When not rocking, he sat mumbling to himself and whined periodically. He continuously sought body contact with teachers and classmates, but seemed otherwise out of contact with the outside world. He had been receiving psychotherapy, but with little positive effect, and his prognosis was considered very poor.

Robert showed severe difficulties in gross and fine motor coordination and laterality. His movements were extremely clumsy, even in simple movements like walking and running. He could not gallop and he skipped very poorly, having great difficulties in alternating between the right and left leg. He had difficulties in catching a ball and holding a pencil.

He also showed severe difficulties in visual perception (his extrapolated perceptual quotient being only 72) and slight difficulties in auditory discrimination. The only verbal subtest score on the WISC which was substantially below average was in arithmetic, which in our experience is strongly influenced by visual perceptual ability. Visual perception, measured in terms of age levels, was as follows: eye-motor coordination, 6.0; figure-ground perception, 7.0; form constancy, 5.6; position in space, 7.0; spatial relationships, 8.3 (the maximum attainable). As stated previously, Robert's chronological age at that time, in 1965, was 10½.

In the performance area, Robert's scores ranged from 5 in object assembly to 10 in picture completion. His performance I.Q. was 87. Low scores on the ITPA were in visual sequential memory, verbal expression, grammatic closure, and manual expression.

The recommendation was for intensive training in visual perceptual skills, in motor skills, and in expressive language.

A year and a half later, Robert was able to return to regular school level, attending a junior high program at the Center in addition. After a further 2½ years of this divided program, he was able to progress well in high school without further help. Although his fine motor coordination was still poor, he had gained enough in sensory-motor skills to be able to compete with his peers on the playground and in the gym. His WISC scores in 1969 were: verbal I.Q. 114, performance I.Q. 99, total I.Q. 107.

In Robert's treatment program, all areas of academic achievement received emphasis, including his body image, upon which we focused directly from the beginning through physical exercise. As Robert's physical skills and his perceptual and expressive abilities developed, his self-image and ability to communicate with the outside world improved also. His emotional difficulties were ameliorated as a consequence. At the same time, his best abilities—auditory reception and receptive language—served him in learning the content subjects suited for his grade level.

Not all children with learning difficulties suffer from sensory-motor dysfunctions. A survey of our children's test results has shown that children may have the same I.Q. score while their patterns of abilities vary. Some children may show high performance abilities and low verbal abilities, or the reverse may be true. Some exhibit disturbances in auditory but not visual perception and others in both auditory and visual perception. Some children have greater disabilities on the perceptual level than on the conceptual level, while the opposite may equally be true. And some children show difficulties in expressive functions, while with others the main problems are in receptive language. In order to outline the classroom procedures appropriate to each child, the results of the tests are plotted. Four tests are given to all the children: the Frostig, Wepman, WISC, and ITPA. Others may be added.

When the child has been in the classroom for a while, the teacher gains many additional insights from his work and behavior which lead to adjustments of his program. Because retesting is undertaken periodically, evaluation is a continuous process.

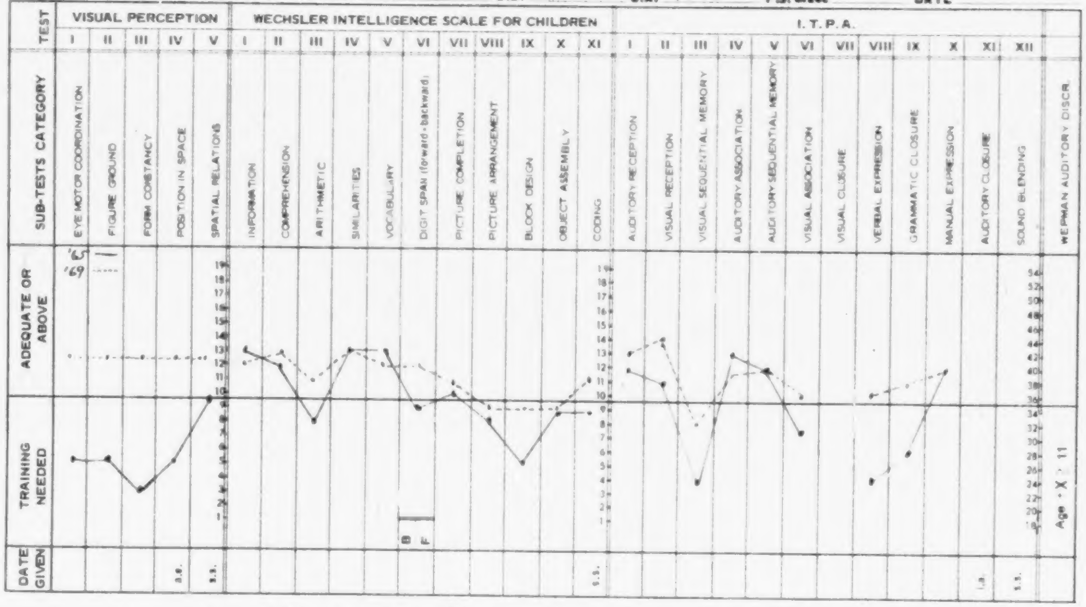
As far as sensory-motor testing is concerned, we have experimented widely in recent years

(Text continued on page 84.)

TABLE III

BASIC TEST RESULTS

CODE # ______ NAME Robert ______ B.D. ______ C.A. 10.5 ______ P.S. Grade ______ DATE ______



2/65 1/69

Perceptual Quotient -
Verbal I.Q. - 109 114
Performance I.Q. - 57 99
Full Scale I.Q. - 93 107
I.T.P.A. Lang. Age -

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SENSORY MOTOR DEVELOPMENT

	TRAINING NEEDED	ADEQUATE OR ABOVE
GROSS M.C.	x	✓
FINE M.C.	x ✓	
LATERALITY	x	✓
EYE MOVEMENT	x	✓

X = 65 ✓ = 69

ACHIEVEMENT TESTING

Date 2/65	Test/Level	Date 1/69	Test/Level	Date	Test/Level
READING	4.6	READING	8.5	READING	
SPELLING	3.3	SPELLING	6.9	SPELLING	
ARITHMETIC	3.9	ARITHMETIC	11.3	ARITHMETIC	

TABLE IV

Frostig Sensory-Motor and Movement Skills Checklist [6]

R. E. Orpet & T. L. Heustis

Name__________ Birthdate__________ Test date__________ Age__________

School__________ Grade__________ Teacher__________ Examiner__________

Does child have any physical disabilities? yes ☐ no ☐ Briefly describe them __________

* * *

The "Frostig Checklist" was developed for the primary purpose of assisting classroom teachers, school psychologists, and other professional school personnel to observe and evaluate selected aspects of the child's motor development. The checklist is intended for use in conjunction with the *Frostig Move-Grow-Learn* program [Frostig, 1969] and *Movement Education: Theory and Practice* [Frostig, 1970].

Seven broad areas of sensory-motor and movement skills [attributes of movement] have been identified: [1] coordination, [2] agility, [3] strength, [4] flexibility, [5] speed, [6] balance, and [7] endurance. The checklist is not a standardized psychometric instrument in which developmental norms are provided at each age level. It is based upon the examiner's observations of the child in classroom and playground activities. Suggestions for training the seven "attributes of movement" are provided by Frostig [1969 and 1970].

Attributes of Movement	Rationale	Illustrative Activity	Severly impaired 1.	Needs training 2.	Adequate 3.	Good 4.	Excellent 5.	Comments	MGL Training Suggestions
1. Coordination a. gross motor	Ability to integrate the various body parts into a smooth flowing pattern of total body movement	tumbling, locomotor skills [running, skipping, hopping], rope jumping, throwing							Coordination Activities: 3, 8, 9, 11, 14, 27, 29, 32

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[6] The development of the checklist was supported in part by a research grant from the Mary J. Palevsky Foundation. Copyright ©1970.

Attributes of Movement	Rationale	Illustrative Activity	Severely impaired	Needs training	Adequate	Good	Excellent	Comments	MGL Training Suggestions
			1.	2.	3.	4.	5.		
b. fine motor	Ability to integrate the movements of the fingers, hands, and wrists into a purposeful synchronized movement pattern	paper & pencil activities, cutting, hand & finger dexterity							
c. eye motor	Ability to coordinate the movements of the whole body or parts of the body with vision	ball catching, ball kicking, bead stringing, "4-Square," tether ball							Coordination Activities: 17, 18, 19, 20, 29
2. Agility	Ability to make rapid changes in direction of movement and/or swift and efficient adjustments in body position	rapid change of body position and/or direction [dodge ball, shuttle runs, sitting to standing]							Agility Activities: 1, 4, 6, 8, 12, 15, 17
3. Strength	Amount of force which may be exerted against a resistance by the various muscle groups								
a. trunk & shoulder girdle		sit-ups, leg lifts, pushups							Strength Activities: 4, 7, 9, 12, 15, 16
b. limb [hand, arm, leg]		pull-ups, jungle gym activities, broad jump, rope climb							Strength Activities: 5, 6, 12, 14, 17

4. Flexibility	Ability to move or stretch the body parts freely and easily through the maximum range of joint mobility	toe touching, back bends						Flexibility Activities: 1, 2, 4, 10, 15, 16, 17, 23
5. Speed	Refers to the amount of time required to accomplish a specific movement pattern or objective	running speed						Body Awareness: 39, 40, 41 Coordination: 15 Agility: 1, 6, 12, 17
6. Balance								
a. static	Ability to make continuous and accurate adjustments of the body's center of mass in relation to a minimal, stationary base of support	standing on tiptoes, standing on one foot [eyes open & eyes closed]						Balance Activities: 1, 4, 12, 14
b. dynamic	Ability to make continuous and accurate adjustments of the body's center of mass in relation to a minimal base of support during locomotion	walking on balance beam						Balance Activities: 6, 10, 11, 13, 14
c. object	Ability to support an object using a part of the body as a minimal base of support							Balance Activities: 7, 8
7. Endurance [Physical Stamina]	Ability to sustain a vigorous physical effort for a prolonged period of time and to resist fatigue	sustained physical activities [distance running, basketball, soccer]						Strength: 5, 14 Body Awareness: 39, 40, 41 Coordination: 9, 13, 14, 15, 29, 30, 31, 32 Agility: 16, 17

and are currently trying to develop a new motor scale based on a survey of the attributes of movement. Until this scale is completed we are using the following checklist (see Table IV).

All children have a 30-minute program of movement education daily. The total movement education program has been under the direction of Tom Heustis, a teacher who has been trained by Dr. Bryant J. Cratty at UCLA. Several of the children who come for tutoring have been found to be lacking in movement skills and have had an individual program of physical education in addition to group participation. During the summer, three kinds of movement education are administered: remedial physical education to small groups and individual children, group exercises for lesser handicapped children, and a developmental program for the children who attend the afternoon play groups.

The Curriculum

Each child's program is based on the initial evaluation and includes both the appropriate ability training and training in academic skills and content matter suitable for his age and grade level. Since our aim is to prepare the child for public school, we have to keep the public school curriculum in mind. Lagging abilities are ameliorated by specially developed teaching programs. For instance, a child who has difficulties in receptive language will get special training in auditory discrimination and language with a focus on his specific deficits; a child with difficulties in balancing will get careful training in movement education with a focus on balance; and a child who is unable to move quickly will also receive help.

While the child's deficits are ameliorated, his strengths are used to teach him new subject matter and skills. For example, a child who has difficulty in visual perception will hear talks and lectures through earphones so that he can receive information through the auditory channel. A child who has difficulty in auditory perception will acquire the same knowledge by reading, looking at pictures, drawing, plotting graphs, and other visual and visuo-motor tasks.

I am convinced that education which takes both the abilities and disabilities of the child into account and which prepares the child for more difficult learning through step-by-step training in developmental tasks is immensely helpful. But it is not sufficient to train a child in lagging abilities. In addition, he usually needs special help in applying the newly acquired abilities to his school learning. For instance, a child may learn to concentrate during movement education, but still may need to be reminded in his classroom and during academic work to concentrate and control his behavior as he does during movement education. A child who has learned to follow a few simple printed directions during movement education needs additional training in the classroom before he can transfer these newly acquired skills to his reading assignment. A perceptually handicapped child who has learned to recognize and copy geometric figures may have to have additional practice with letterlike figures and letters, but he will probably have an easier time learning to read and write after visual-perceptual training. Most frequently, satisfactory transfer to academic areas is possible when similarities between the ability training tasks and the academic tasks are pointed out. This rule applies to all forms of ability training.

Discussion of Results

It is very difficult to state the results of our movement education program in statistical terms. This is because (1) results of special education depend very much on the kinds of children in a program; at our Center populations shift from year to year; (2) we have not had a completely satisfactory tool with which to measure movement skills and have had to experiment with new forms of evaluation; (3) we work with an integrated program which focuses on all areas of development; and (4) the program was finalized only one year ago and only preliminary results are available.

About two-thirds of the children who attend the Center return to regular public or private school, and a great percentage of these children continue through college. Other children need to enter special classes. The school population at the Center does not differ in I.Q. or diagnostic categories from that of classes for the educationally handicapped. One way to estimate the results of the program would be to compare the percentage of children at the Center who return to regular classes with the percentage of children who return to such classes from the special education programs in public schools. We are unable to report these figures, but the percentage of successful integration after attendance at our Center seems to be high as compared with the figures reported in various publications.

Table V gives the test and retest scores from the use of the research edition of our sensory-motor battery with a sample of children with learning difficulties.

TABLE V

PRE AND POST SENSORY-MOTOR AND MOVEMENT SKILLS

TEST RESULTS (N = 26)

Test	Attribute of Movement	Brief Rationale	Pre-Training Mean	Post-Training Mean	t-Test	Significance Level
1. Bead Stringing	Coordination	Fine motor and eye motor, coordination and integration	12.31	14.81	5.30	PL. 01
2. First-Edge-Palm	Coordination	Unilateral motor sequencing	5.73	8.77	5.41	PL. 01
3. Bean Bag Throw	Coordination	Gross motor coordination	2.28	3.36	1.93	PL. 05
4. Rail Walking	Dynamic Balance	Ability to make adjustment in body's center of mass during locomotion	27.96	36.08	3.63	PL. 01
5. Sitting-Bending-Reach	Flexibility	Ability to stretch body parts through maximum range of joint mobility	-1.46	-.77	1.29	N.S.
6. a. One foot stand, eyes open	Static Balance	Ability to make adjustments in body's center of mass while stationary (eyes open and closed)	8.42	12.66	4.36	PL. 01
b. Eyes closed			5.00	7.96	4.11	PL. 01
7. Sit stand	Agility	Ability to make rapid changes in direction of movement	5.12	7.19	4.51	PL. 01
8. Standing Broad Jump	Strength	Explosive leg strength	39.81	42.88	2.81	PL. 01

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PROMOTING LEARNING READINESS SKILLS THROUGH PERCEPTUAL-MOTOR TRAINING IN PHYSICAL EDUCATION

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Introduction

Basic to this curriculum is the contention that the following approach to education can be designated as the "physiologic approach." This approach views the child as a sensory-perceptual-motor organism who is confronted with a variety of energy forms. Somehow, these forms must be converted into meaningful systems of information if the child is to achieve full efficiency as a learner. The learner is a space oriented being with a physiologic make-up designed to travel through "educational space," processing information to his advantage.

Our regular curriculum is based upon certain assumptions. The first assumption is that children of average intelligence have become sufficiently successful at processing information by the time they reach five years of age, and that the composite of such efficiency can now be brought to bear upon comfortable academic achievement. The second assumption relates to the belief that the typical child-rearing pattern provides a sequence of experiences which becomes a foundation for academic advancement. Given a child from a reasonably intact family, both assumptions are believed applicable when he enters kindergarten.

The physiologic approach maintains that such assumptions are invalid. Many children in this society, by virtue of variation in experience, opportunities, parental emphasis, and minor forms of developmental failures, begin school unqualified by inadequacies in their basic training to meet the demand of our curriculum. Many children have not yet become efficient listeners by age five, although their auditory system is intact; they lack efficiency in visualization despite a healthy visual system and adequate sight. They have not learned to appreciate their tactual senses even through their hands and bodies have no physical impairment. The child can move, but he cannot transport his body with ease and gracefulness. The basic equipment for every child is there, but the five years of basic training to prepare him to meet the curriculum demands have emphasized objectives other than those of the academic world.

Philosophy

1. There are perceptual skills which can be developed and trained.
2. Academic performance in today's schools depends heavily upon form and symbol recognition and interpretation.
3. The development of perception is in relation to the levels of coordination of the body system, i.e., the more highly the coordination of the body parts and body systems, the better the prospects are for development of form perception.
4. Through the development of the child's perceptual skills, the child can profit better from instruction, and learn independently. The greater the perceptual skill development, the greater is the capacity for effective learning.

This program does not apply to children with minimal abilities or severe disabilities. This program will assist all children who are not disabled through extreme physical or mental deficiencies.

The goal of the curriculum is, therefore, to achieve a state of physiological readiness in the learners, a level of total organization, so they may profit from the curriculum.

Curriculum Goals

To provide specific experiences in total body movement. The child learns to direct his body.

To provide the opportunity for children to explore and develop the interrelationships of both sides of their bodies and the combinations of movements involved in balance, as well as visually directed moves for the improvement of balance and coordination.

To provide children, through physical activities, with eye-hand coordination. Hands teamed with eyes can serve as a tool of expression.

To provide physical activities which can aid in the formation of concepts. Right, left, up, down, clockwise, counterclockwise may be introduced and used instructionally.

To provide children with improved muscle tone through regular exercise, and most important of all, to help children learn to use their muscle power to meet their daily problems.

To provide children with a wide variety of movement activities so that they are aware of top and bottom within themselves and the external environment.

To provide children with an opportunity to explore space with their own bodies, experimenting with upside-downness, overness, and underness, and using their own body parts as directional coordinates.

To provide activities designed to improve listening, broaden children's attention span for auditory materials, and increase children's alertness to verbal direction.

To provide activities which will help children to process the feeling of movement. Children are given the opportunity to become more aware of how muscles feel in a relaxed state versus a tension state, how muscles feel when stretched, and how to organize their body parts to achieve movement.

To provide children with the opportunity to move gracefully and skillfully in a variety of rhythmic activities.

To provide physical activities which will help children develop the capacity to modify or shift patterns of movement appropriate to the situational demands.

Kindergarten Perceptual-Motor Training Curriculum

The following list of activities will be presented within each of the 12 dimensions. These activities are to be presented to all members of the class.

DYNAMIC BALANCE

Purpose: The walking beam program is designed to give children the opportunity to explore and develop the interrelationships of both sides of the body and the combinations of movements involved in balance, through auditory and visually directed moves for better balance and coordination.

Classroom activities:

Balance beam with variations, particularly the use of visual targets and also arm positions with a variety of balance stunts.

Balance beam activities with the use of blindfolds to develop auditory, motor, and memory abilities.

SPATIAL AWARENESS:

Purpose: To have children explore and identify their position in space relative to surroundings, with constant orientation to surface, elevation, periphery, back and front.

Classroom activities:

Exploration movements with and without blindfolds and also with the use of wall targets.

Geometric shapes duplicated by walking, running, and jumping on the floor.

Balance beam backward and with half and full turns.

General coordination exercises with blindfolds and with the use of ceiling and wall targets.

Trip planning and whistle drills; pupils are blindfolded, they respond to verbal information which calls for knowledge of relationships of self in space, such as location of body parts and spatial concepts of right, left, up, down, forward, sideward, etc.

Elastic rope activities involving use of body over and under and through with and without blindfolds, and also the use of wall targets (crawl, elbow drag, seat drag).

MUSCULAR STRENGTH:

Purpose: To give children the opportunity to improve muscle tonus, power, and stamina, appropriate to body size and chronologic age, to meet daily demands.

Classroom activities:

A limited number of general coordination exercises with and without blindfolds and also with the use of ceiling and wall targets—prone, supine, sitting on floor, standing.

BODY AWARENESS:

Purpose: To give children the opportunity to familiarize themselves with the relationships of body parts to movement, and to be able to label body parts and to appreciate their functional properties.

Classroom activities:

Movements of exploration
General coordination exercises
Gross body image
Trip planning
Whistle drills

VISUAL DYNAMICS:

Purpose: To help children achieve the highest possible efficiency in a variety of visual training activities by having them fixate accurately on targets at near, mid, and far points in space, scan a surround for meaning in the vertical and horizontal planes, converge and accommodate, equalize the use of both visual circuits in a binocular pattern, achieve fusion, and steer the body in proper alignment for movement through space.

Classroom activities:

Visual targets always used for crawling, rolling, walking, beam and rail, tumbling, trampoline, tracking of a ball on a string (sitting, supine on the three coordinates).

Ball control (with and without blindfolds)

Ball control with the use of wall targets

Toss-bounce-catch

Toss-clap-catch

Hand dribble

Throwing and kicking using varying shapes and sizes of wall targets and ground targets set at various distances and using both sides of the body.

Jumping (with and without blindfolds and also with the use of wall targets)

Rope jumping (long and short ropes)

Elastic ropes

Jumping floor patterns

Jumping off of apparatus (benches, tables, Swedish Box)

For visual memory:

Tachistoscope

  Jumping geometric floor patterns

  Trampoline bouncing geometric patterns

  Jumping from apparatus (letters, numbers, work recognition, and wall targets).

AUDITORY DYNAMICS:

Purpose: To give children the opportunity to improve listening skills, achieve the intended goal, and increase the auditory memory span of each child.

Classroom activities:

Tactile discrimination while the child is blindfolded, a series of "touches" with pause between stimulation and response. Progression in difficulty is attained by pattern of stimulation (touches) which requires responses involving bilateral, homolateral, cross patterns, and over the mid-line moves.

Jumping geometric patterns on floor blindfolded, after observing a visual symbol or series of symbols (visual memory).

Ball control (eyes closed)

  Toss-bounch-catch

  Toss-clap-catch

  Hand dribble

  Ball-bounce-glide

Rope jumping while blindfolded (short rope), listening for the sound of the rope touching the floor.

Tumbling

  Pad Drills

  Tumbling series

Whistle and drum beat drills

Turn series (¼, ½, ¾, and full)

Trip planning while blindfolded, must plan his response by identifying and decoding various changes in auditory stimulation.

Singing story play—auditory memory

Response to various rhythm instruments

KINESTHESIA:

Purpose: To bring children to awareness of position in space and to recall patterns of movement from previous experiences for use in resolving demands.

Classroom activities:

General coordination exercises

Rolling

Walking, running, galloping, etc.

Ball control with the use of all sized balls.

Jumping in place from a height, and also over obstacles (use wall targets)

Movements of exploration

TACTILITY:

Purpose: Giving children the opportunity to make tactile discrimination, and training by having pupils respond to increasingly complex tactile stimulation.

Classroom activities:

Identification of known and unknown objects by touch. To stimulate a tactile-proprioceptive response, the pupil is instructed to touch himself where he is being touched.

Ball control (eyes closed)

  Toss-bounce-catch

  Hand dribble

Obstacle course

BILATERALNESS:

Purpose: To give the children a chance to reciprocally interweave two sides in a balanced relationship to thrusting and counter-thrusting patterns around the three coordinates of vertical, horizontal, and depth in proper alignment, from initiation to completion of a task.

Classroom activities:

General coordination exercises using targets

Jumping geometric figures on floor blindfolded

Jumping geometric figures with the use of tachistoscope

Trampoline-jumping geometric patterns with the use of wall targets and tachistoscope

Tumbling series with the use of wall targets, flash cards, tachistoscope

Throwing and kicking various sized balls, throwing bean bags at wall, with both sides of the body and with suspended and ground targets set at various distances.

FLEXIBILITY:

Purpose: To provide children with activities that provide numerous experiences, differences in tempo, patterns, routes, and modes.

Classroom activities:

Response to sudden changes in drum beats

Movements within tires (bike and hoola hoops)

Story play with directions to follow

Movements with elastic ropes

Songs that give directions to follow

Movements with bouncing balls

RHYTHMS:

Purpose: To give children the experience of synchronizing patterns of movement according to situational demands, thus achieving harmony, grace, and use of movements.

Classroom activities:

Move body parts to beat of metronome (sitting, standing, walking)

Rhythmic movements to drum beat–walk, gallop, jump, crawl, parade, tiptoe, walk and stop, walk and run, walk and flop

Bouncing balls to rhythm beat

Folk dances

Singing games

Dance a story play

MOTOR PLANNING

Purpose: To give children a knowledge of one's own movements, movement repertoire, and a spatial estimate of the present demands.

Classroom activities:

Catching balls, throwing balls at targets of varying sizes and shapes

Kicking balls at targets

Hand dribbling (all ball sizes)

Trampoline activities

Juggling–using two balls

Physical Education Perceptual-Motor Training Program for Kindergarten Children

THE PHYSIOLOGY OF READINESS EXPERIMENT THROUGH PERCEPTUAL-MOTOR TRAINING:

A pilot experimental program was conducted during 1968 in the kindergarten classroom of the Alice Callen Elementary School in Ripon Wisconsin. The program was operative for 18 weeks during the second half of the school year. The experiment dealt with the application of perceptual-motor skills to academic task development on a physiological basis.

Hypothesis:

Readiness for academic tasks can be systematically developed on a physiological basis, and such higher levels of readiness contribute directly and significantly to children's academic success. (In this case, readiness for academic learning.)

Procedure:

Two kindergarten classes were selected for the experiment. One class served as the control group and the other as the experimental group. Pre-tests were given using the test described in the next section. The program commenced at the start of the second half of the school year and ran for 18 weeks. The experimental groups was given 30 minutes of perceptual-motor training and 10-20 minutes of selected Frostig materials daily. After 18 weeks, the post Frostig test, mental ability test, and the readiness test were given. The procedures used in the training program are described in the curriculum outline in the last section of this study.

Results:

The statistical results are described in the next section. The experimental group surpassed the control group in visual perception, mental ability, and readiness skills by a significant margin. Since the classes were comparable with respect to distribution of abilities, and since the only variable in instruction was the experimental procedures, it is reasonable to conclude that:

1. Readiness for academic tasks can be systematically developed.
2. Higher levels of physiological readiness contribute to increasing children's capacity for academic achievement.

Therefore:

It is concluded that the hypothesis is affirmed and that further experimentation is fully justified.

Observations:

Certain cautions should be expressed concerning this experiment:

1. While the two groups of kindergartners were comparable in pre-Frostig Developmental Test for Visual Perception, both classes proved to have abilities above the test norms.
2. The intelligence tests at the kindergarten level are considered somewhat unreliable.

Some of the beneficial side effects observed by the teacher of the experimental group were:

1. There was increased self-control over attention and concentration, enabling the child to exhibit a higher ability to learn.
2. Increased independence, maturity of behavior and attitude, and increased self-respect and self-confidence were evidenced.
3. Student interest was extremely high.
4. Handwriting skills improved greatly.

5. Children showed a marked gain in locating themselves in time and space (orientation).
6. Geometric forms were easily recognized and replicated by the children.
7. Directionality was easily established.

SUMMARY:

The development of perceptual skills through a systematic perceptual-motor training program designed to better prepare children for the academic demands of the classroom resulted in gains in academic performance with an unusually high level of significance. It was concluded that perceptual-motor training could be a useful adjunct to the regular physical education curriculum, as it increases the child's capacity for academic achievement.

An Experimental Program Testing the Development of Perception in Kindergarten Children

An 18-week experimental program was conducted at the kindergarten level in 1968. Two kindergarten classes taught by the same teacher were chosen, one for the experimental group and one for the control group. Twenty-six children were matched by pre-testing the groups with the Marianne Frostig Developmental Test of Visual Perception, and were randomly assigned to one of the two groups. Pupils in the experimental group received 30 minutes of instruction using the physical education perceptual-motor training. The control group received the standard physical education curriculum that used games of lower organization, tumbling, rope jumping, throwing and catching skills, kicking, and locomotor skills to rhythms.

The experimental and control groups were pre- and post-tested with the Frostig Developmental Test of Visual Perception. The Otis-Lennon Mental Ability Test, Gates MacGinitie Readiness Skill Test, and Metropolitan Readiness test were also administered to both groups at the end of 18 weeks.

Treatment of the experimental study results were based on acceptance or rejection of the *null hypothesis* at the .05 level of confidence. The means, standard deviation, standard error of the mean, and "t" ration were the statistical methods used in determining the significance at the .05 level which required a value of 1.71.

The "t" ratio in the pre-Frostig test showed no significant difference between the experimental and control groups. This indicated that the groups were well matched on these variables.

The post-Frostig test performances were found to be significant far beyond the .05 level. To be significant at the .05 level required a "t" value of 1.71. In this analysis, a "t" value of 3.64 was obtained, indicating that the differences in performance favoring the experimental group were *highly significant.*

The Otis-Lennon Mental Ability Test results showed that the I.Q.'s of the students in the experimental group were considerably higher than those of the control group. The results were significant at the .05 level, with a "t" value of 2.39.

The readiness tests showed that the experimental group demonstrated an unusually high performance in the Metropolitan Readiness Test with a "t" value of 3.78. While the readiness performance in the Gates MacGinitie test showed a lower correlation of a "t" value of 1.35, the null hypothesis would be excepted at the .10 level of confidence.

The following tables show the means, standard deviation, standard error of the mean, and "t" value of each of the test results for the experimental and the control groups. The significant gains favoring the experimental group in this limited study are, therefore, presumed to be due to the experimental procedure, and indicate that further experimentation is warranted.

Frostig Developmental Test of Visual Perception (pre-test)

Group	Mean	S. D.	SEM	"t"
Control	98.9	15.02	4.17	
Experimental	104.7	11.85	3.29	.11

Frostig Developmental Test of Visual Perception (post-test)

Group	Mean	S. D.	SEM	"t"
Control	110.5	8.52	4.17	
Experimental	114.7	6.84	3.29	3.64

Otis-Lennon Mental Ability Test

Group	Mean	S. D.	SEM	"t"
Control	109.2	13.32	6.60	
Experimental	119.3	9.26	2.57	2.39

Metropolitan Readiness Test

Group	Mean	S. D.	SEM	"t"
Control	88.4	12.72	3.53	
Experimental	96.2	4.90	1.36	3.78

Gates MacGinitie Readiness Skill Test

Group	Mean	S. D.	SEM	"t"
Control	81.6	16.97	4.71	
Experimental	89.1	10.69	2.97	1.35

DIFFERENTIAL EDUCATION

An ESEA Title III Project

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Rationale

The theory upon which the program is based emphasizes perceptual development in children. Perception is the bridge between the human being and his environment; it is the ability to recognize stimuli, which includes the reception of sensory impressions from one's body. It also encompasses the capacity to identify and interpret these sensory impressions by correlating them with previous experiences. Large random movements and the accompanying motor movements (obtained from birth on) prepare the child for the more refined motor tasks that come later in the developmental sequence. Near-point vision and fine motor tasks cannot be achieved adequately until the child has mastered gross motor patterns of action. The two primary senses which allow man to extend beyond his body in terms of functioning in and reacting to his environment are the visual and auditory.

By virtue of his physiological and anatomical makeup, 95 percent of man's cerebral cortex is involved with these mechanisms. The growth and developmental sequence involves learning to control his body processes in coordination, directionality, and spatial orientation; learning to relate to himself; learning to relate to the world outside of himself; and learning to understand, organize, and utilize the world outside himself.

This philosophy is born out of research of individuals and institutions, such as: the Gesell Institute of Child Development in New Haven, Conn., under the direction of Frances L. Ilg, Louise Bates Ames, Richard J. Apell, and John Streff; the Institutes for the Achievement of Human Potential in Philadelphia, under the direction of Glenn Doman and Carl Delacato; Winter Haven Lions Research Foundation, Winter Haven, Florida; Maria Montessori of Italy; G.N. Getman of Minnesota; Newell C. Kaphart of Purdue University; Eugene B. Spitz of Philadelphia; D.O. Hebb, McGill University, Montreal, Ontario, Canada; Darryl Boyd Harmon of Austin, Texas, Jean Piaget of France; Katrina deHirsch, William L. Langford, and Jeannette Jefferson Jansky of the Columbia Presbyterian Medical Center in New York City; and William L. Rutherford of Tarkio College, Tarkio, Missouri.

The following abstracts are included to emphasize the importance of perceptual-motor development and its relationship to total pupil performance.

1. Ilg, Frances L.; Ames, Louise Bates; and Apell, Richard J. School readiness as evaluated by Gesell developmental, visual, and projective tests. *Genetic Psychology Monographs* 71:1:61-91, 1965.

   A public school population of 81 kindergarten, 26 first grade, and 31 second grade students were screened for three successive years on developmental, projective, and visual tests. Up to 50 percent of the students appeared unready for the grade to which they had been assigned on the basis of chronological age alone. Test findings were highly consistent from one year to another. For younger students, there was a higher agreement (83 percent) between predictions made on the basis of developmental test findings in the fall of any year and teacher judgement in the succeeding spring. (Author abstract)

2. Kephart, Newell C. Perceptual-motor aspects of learning disabilities. *Exceptional Children* 31:4:201-206, 1964.

   This paper stresses the importance of perceptual-motor orientation in the child as a foundation for the symbolic and conceptual activities of the classroom. Consistent and efficient motor patterns permit the child to explore his environment and systematize his relationship to it. Perceptual data are similarly systematized by comparing them with this motoric system. Through such perceptual-motor matchings, the perceptual world of the child and his behavioral world come to coincide. It is with this

organized system of perceptual input and behavioral output that the child attacks and manipulates symbolic and conceptual material in a veridical fashion. (Author abstract)

3. Frostig, Marianne. Visual perception in brain-injured children. *American Journal of Orthopsychiatry* 33:4:665-71, 1963.

   Perceptual disability, regardless of etiology, can be detected and specific perceptual training instituted. A test has been devised to give a child's perceptual age and quotient. Five areas of perception were used: eye-hand coordination, figure-ground perception, perception of form constancy, perception of position in space, and of spatial relationships. These abilities were chosen because of their crucial importance for school learning. They were found to develop relatively independently of each other. It was found that development of visual-perceptual processes is a major function of the growing child between ages of three and seven, and that at this age level perceptual development becomes a most sensitive indicator of developmental status of the child as a whole. (R.E. Perl)

4. Gesell, Arnold. Child vision and developmental optics *Annee Psychologie* 50:379-95, 1951.

   Developmental optics is concerned with the ontogenesis and organization of visual functions in their dynamic relation to the total action system, and is a logical and necessary extension of visual science. Vision is an act mediated by eye and brain, but emanating from a growing action system. Specific acts of vision emerge within the total unitary pattern of the organism. Nothing less than a systematic developmental methodology can do justice to the stable and changing characteristics of vision through infancy and childhood. (E.C. Bird)

5. deHirsch, Katrina; Jansky, Jeannette Jefferson; and Langford, William S. Identifying preschool children who may experience academic difficulties. In *Predicting Reading Failure: A Preliminary Study of Reading, Writing and Spelling Disabilities in Preschool Children.* New York: Harper & Row, Publishers, 1966. 144 pp.

   Twenty years of clinical experience with intelligent but educationally disabled children whose learning drive has become severely damaged has convinced us that many of these children would not have required help had their difficulties been recognized at early ages. Early identification would have obviated the need for later remedial measures.

   This study has attempted to develop techniques for the early identification of children who, at kindergarten age, seemed to present a specific pattern of dysfunctions, reflecting an underlying developmental lag.

   Children's developmental rhythm varies widely. Recognition of and respect for these variations are crucial at a time when society places increased pressures for early achievement on both children and parents. Such recognition implies the taking of active educational measures geared to the child's individual needs at his particular developmental level. (Author summary)

It is the intent of this project to draw together a program for use in the classroom which will incorporate conclusions from the aforementioned institutions and research projects, as well as the experiences of the Easter Seal Foundation (Milwaukee, Wis.) and the Optometric Extension Program (Duncan, Okla.). New related research and findings will be continuously evaluated and correlated with this program.

Brief Description of Involvement By Multidisciplinary Personnel

This approach to assessing children will result in curriculum revisions which will utilize a multimedia approach to the child's multisensory learning. To take maximum advantage of the knowledge from the diagnostic screenings, a multidisciplinary team was created. The team included a vision consultant, auditory specialist, psychiatrist, psychologist, neurologist, pediatrician, ophthalmologist, educational diagnostician, school social worker, physical education teacher, language arts specialist, media specialist, perceptual development specialist, and classroom teacher.

A unique role in the educational setting has been instituted in the eight elementary schools as a result of an analysis of this perceptual development model. The role of perceptual development specialist was created to implement diagnostic screening, multidisciplinary liaison, and curriculum revision in as efficient and effective manner as possible.

Their responsibilities are the following:

A. Administer, evaluate, and interpret individual and group screening and diagnostic instruments.

B. Work closely with building staff, children, parents, and the health department in evaluating, planning, and programming for the child's educational needs based on test results.

C. Refer children to professional medical interdisciplinary team when necessary; confer with this team to assist in the interpretation of the results of testing and recommend appropriate avenues of procedures to meet the needs of the individual child.

D. Prepare comprehensive screening study on such students who indicate perceptual handicaps and/or learning problems.
E. Assist in the development and implementation of programs for children with perceptual handicaps and/or learning problems.
F. Demonstrate screening and diagnostic procedures.
G. Instruct teachers in the use of multimedia approaches in assisting children with learning disabilities.
H. Demonstrate and consult on teaching techniques and procedures used with children having perceptual handicaps.
I. Work with small groups or individual students according to specific needs.

It is understandable that since this is a new concept in education, few people have received training for this role. Thus, we have attempted to provide these people with an opportunity to gain as much experience as possible in perceptual development, balanced with on-the-job training.

Role of the Physical Educator

The role of the physical education teacher has always been an important ingredient in the child's total education. This kind of teacher has given him an opportunity to build positive self and peer images, and develop interests that will carry over to a lifelong sports program.

Our new challenge to physical educators is a very important dimension to the teaching of classroom curriculum, and commences with gross motor screening of children. We must become knowledgeable of experiences and activities involving space that help develop spacial awareness, which is essential to the concept of reading from printed pages and writing. Eye-hand coordination skills basic to many classroom tasks can be developed through game experiences such as bean bag toss and peg boards. Concrete experiences using the body and/or props to form letters or numbers help many children who demonstrate reversal difficulties. Use of the trampoline with specific activities can enhance visual and auditory memory, as well as increase attention span. We must communicate with all disciplines if children are to benefit, "for it is (because of) the child that we are here."

Results of Project Efforts – Assessment

The following are products expressing attainment of goals set forth in this project.

1. A primary curriculum guide, based on physiological development, is presently being implemented in the first four years of elementary school. Effective utilization of the guide presupposes placement on the basis of knowledge of a child's developmental age.
2. A preschool planning guide presents a model for a limited program designed to bring the preschooler into the educational setting one year earlier than normally expected. Activities provided are designed to develop gross motor skills, fine motor skills, and listening skills.
3. A committee of the physical education teachers, charged with the responsibility of developing a K-12 physical education program, is completing its task. This revision in the physical education curriculum will emphasize gross motor movements designed to prepare the child for the refined motor skills necessary for academic school programs.
4. An intermediate curriculum study group (grades four through six) is completing work on a continuation of the primary curriculum. Members consist of intermediate grade teachers, reading teachers, perceptual development specialists, and a junior high school representative.

   Some members of the committee also served on the primary committee, thus a more meaningful articulation is possible.
5. All kindergarten and first grade children and all children referred for services are administered the following battery of screenings, tests, or diagnostic services:
   a. Gesell Developmental Examination. Primarily K and 1.
   b. Michigan Vision Testing or Sight Testing. The Michigan Vision Test is administered via the Titmus instrument by Oakland County Health Department technicians. Children who, for some reason, do not receive this test are administered a sight test via the Telebinocular instrument by a perceptual development specialist.
   c. Vision Screening Profile. All children K-1 and referrals are screened by the perceptual development specialist on a primary basis. Those who fail are rescreened by a consultant on a secondary basis. Children who score low are programmed educationally; those who fail are referred for professional assistance outside the school environment.
   d. Perceptual-Motor Activities Screening. Same procedure as for visual skills screening.
   e. Puretone Hearing Test. All K-1 and referrals are administered a

pure tone auditory test by an Oakland County Health Department technician or one of the perceptual development specialists who has been trained in auditory pure-tone testing methods.

f. Raven – Coloured Progressive Matrices. All K-1 and referrals through age 10 are administered this test of logical reasoning as a screening procedure. Children who perform poorly are recommended for further testing in intelligence.

g. Central Auditory Abilities. Administered to all K-1 children. This is a structured training program which provides language enrichment through development of auditory perceptual abilities for children with identified auditory perceptual deficits. The program is being integrated into the primary curriculum.

The results of these various assessment procedures enable us to appraise the child's unique abilities and provide a program tailored as closely to his needs as possible. Since it is unfeasible to provide a completely unique program for each individual, grouping children according to needs with the availability of multi-sensory multi-media effectively approximates individualization of the curriculum.

This approach is enhanced by the nature of the staffing of the elementary schools. Assigned to the staff of each school is the equivalent of a full-time perceptual development specialist, physical education teacher, language arts teacher, fine arts teacher, and media specialist.

The noneducational consultants are available to the schools on an "on-call" basis.

7. The major emphasis for the parent education program is the mandatory attendance in the preschool program. Each session of the preschool program is devoted to disseminating information about the project, school district, and child growth and development.

During the 1968-1969 school year, the role of perceptual development specialist was created. In order to test the concept, 2½ positions were filled in three schools. The Gates-MacGinitie, as explained previously, was given on a pre-post basis. The Raven Coloured Progressive Matrices (nonverbal IQ) and Development Placement Scores were used as covariates in an analysis of covariance designed to test readiness performance, based on the premise that the perceptual development specialist would have an impact on readiness at the K-1 level. The school which conducted the strongest visual-gross motor program, judged both in terms of personnel and time involved in training, was selected as the experimental group. Three other schools, which were comparable in enrollment but lacked either a perceptual development specialist or very strong program, were designated as the control group.

The results of this study (hardly conclusive because of lack of control of some variables) are shown in Tables 1 through 4. Although complete control of variables such as age of teachers, experience of teachers, and develop-

TABLE 1

ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL KINDERGARTEN STUDENTS' READINESS PERFORMANCE

RESIDUALS

Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	f
Between	1	993.25	993.25	9.86[a]
Within	268	27008.36	100.78	
TOTAL	269	28001.61		

a/ Significant beyond the 0.01 level

TABLE 2

KINDERGARTEN STUDENTS' CRITERION AND CONTROL VARIABLE MEANS

		CRITERION			CONTROL	
		Post Readiness				
	N	Adjusted	Unadjusted	Pretest Readiness	IQ	DA
Experimental Group	72	98.71	95.22	68.44	15.90	4.5
Control Group	199	94.33	95.59	75.66	14.67	4.6

TABLE 3

ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL FIRST GRADE STUDENTS' READINESS PERFORMANCE

RESIDUALS				
Source of Variation	Degrees of Freedom	Sums of Squares	Mean Square	f
Between	1	82.44	82.44	2.58
Within	236	7548.34	31.98	
TOTAL	237	7630.78		

TABLE 4

FIRST GRADE STUDENTS' CRITERION AND CONTROL VARIABLE MEANS

		CRITERION			CONTROL	
		Post Readiness				
	N	Adjusted	Unadjusted	Pretest Readiness	IQ	DA
Experimental Group	67	115.38	115.69	109.07	17.91	5.6
Control Group	172	116.69	116.57	107.87	17.92	5.4

mental ages is less than would be desired, the study does suggest that, at the kindergarten level (f=9.84), the services of a perceptual development specialist in a "strong" perceptual development program can contribute to academic readiness. This does not, however, hold true for the first grades of schools involved in this study.

Yet to be resolved, relative to this project, is the causal relation between the perceptual tests and academic achievement and/or readiness. Once resolved, further substantive data can then be provided to guide educational institutions interested in perceptual development, physiological readiness, and nongraded instruction.

THE DAYTON SENSORIMOTOR TRAINING PROGRAM FOR THREE-, FOUR-, AND FIVE-YEAR-OLDS

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Introduction

In his book, *The Origins of Intelligence in Children,* Piaget (1) stated that the sensorimotor adaptions of the child's brain begin at birth and continue to about 6½ years of age. He also stated that no child should be denied experiences which would lead toward stimulation of the senses and bodily coordination.

Many child development specialists are in agreement that 40 percent of the child's adult brain capacity has been reached by the time he is four years old, and that by the time he is eight years old, 80% of the adult capacity has been reached.

Since children do not always develop coordination automatically, or at the same age as other children, it often becomes necessary to train them through different experiences so that they feel confident in the ability to use their bodies in play situations.

A wealth of sensory experiences is important for the integrated functioning of the brain. Many children have been denied critical sensorimotor experiences because of one of the following conditions:

(1) A type of cerebral dysfunction
(2) A lack of natural childhood experiences due to cultural disadvantage
(3) Emotional upset
(4) Overprotective parents who stifle the child's natural instinct toward pursuing his own developmental processes.

The rationale for the *Early Childhood Education Project* (ECE) sensorimotor training program is based on the hypotheses that, by providing daily training in the sensorimotor areas during the critical stages of sensorimotor adaptions from ages three to five, many children will be able to overcome perceptual problems that hinder learning in the primary grades. Thus, this program is designed to *prevent* problems from occurring in the perceptual-motor areas.

Sensorimotor training is a component of the Early Childhood Education Project of the Dayton City Schools. This project enrolls over 3,000 three-, four-, and five-year-old children in 22 school districts within the city of Dayton. The early childhood centers are all located in low socioeconomic areas.

The Program

Activities were planned according to the following sensorimotor areas:

1. Body image and space and direction awareness
2. Balance
3. Basic body movement
4. Symmetrical activities
5. Eye-hand and eye-foot coordination
6. Large muscle activities
7. Fine muscle activities
8. Form perception
9. Rhythm

During the first year, 821 children were enrolled in the ECE sensorimotor skills program. In order that each child might receive the same type of instruction, a manual was developed: *Sensorimotor Training for Teachers and Parents of Pre-School Children* (2). Introduced early in the year as a guide for the head teachers, the manual was later commercially published. Classroom activities of the program were organized in developmental sequence to cover the nine sensorimotor areas described at length in the manual.

In initiating the program during the 1967-68 school year, three sensorimotor consultants were assigned to the five schools in the project which had the greatest incidence of deprivation. Using the activities described in the manual, the consultants demonstrated in each classroom, once a week. An assignment of activities was made from the manual for the classroom teacher to integrate with other aspects of the ECE curriculum during the following week.

Training in auditory discrimination occurred throughout all areas listed above, as this was felt to be one area in which many children were deficient.

Aids developed during the first year were two movies designed to help teachers and parents give better training in sensorimotor development. The first, an 8 mm film which shows children with specific handicaps, aids in the identification of problems. The second, a 16 mm sound film, serves as a model for using recommended training activities.

Sensorimotor training became an integral part of the entire ECE curriculum in 22 centers during the 1968-69 school year.

Throughout 1968-69, two sensorimotor specialists and two aides helped teachers in the use of the manual by demonstrations during visits to their classes. The film, *Sensorimotor Traning,* which had been produced the first year, was used as a training aid for the teachers and parents of children enrolled in the program.

A new aspect of the sensorimotor training for this year was a swimming program planned in coordination with a three member team from American Red Cross Water Safety Instruction. Parents and teachers went with the children to one of the YMCA swimming pools for an introduction to water and swimming safety. Approximately 700 three- and four-year-olds participated in the program.

An ice skating program was introduced to more than 1,100 children from the ECE kindergarten centers.

SCOPE OF THE SENSORIMOTOR PROGRAM IN ECE CENTERS

Developmental equipment supplied in each ECE center to make these activities possible include the following:

Paper and crayons (set for each child in class)
Walking board (1)
Balance boards (3)
Eight-foot ladder (1)
Twist boards (3)
Tumbling mats (2)
Small bells (12)
Rhythm band instruments
Masking tape
Rope (2 25 foot lengths)
Geometric templates: circle, square, triangle (4 sets)
Balloons (144)
Magnets (6)
Peg boards (2)
Puzzles (12 different)
Workbench (1)
Ring toss game (1)
Clay
Beads (6 sets)
Burlap and needles
Sewing and lacing board
Finger paints
Tape recorder
Record player
Chalkboard
Bean bags (12)
Playground balls
Ping-Pong balls
Tennis balls
Whiffle balls
Parachute (1 for program)

LONGITUDINAL RESEARCH STUDY

A longitudinal research study of the effects of sensorimotor training on four-year-old children and its relationship to school achievement at the end of the first grade was begun in 1967-68. This study has been designed as a pilot study of perceptual-motor objectives, programming, and evaluation from prekindergarten through first grade. The study was one of the types of research recommended by the Perceptual-Motor Symposium conducted by AAHPER in May 1968. The chart on the next page gives a description of the research design.

CONCLUSIONS OF PHASE I

At the end of Phase I, an analysis of variance was made from the results of a locally sensorimotor survey. The null hypotheses was that no significant difference existed between experimental and control groups and that physical maturity of four or more months was not a significant factor. From this study and its analysis of variance, it was concluded that, for preschool children:

1. Age levels had a significant effect on sensorimotor performance.
2. Treatment, or training in specific sensorimotor skills, had a significant effect on sensorimotor performance.
3. The effects of age level, or maturation, and training in sensorimotor skills interacted to a significant degree.

Thus the null hypothesis were rejected.

It was recognized during the first phase that later kindergarten experiences would foster the learning of sensorimotor skills for all children, and that maturation would continue to be a factor for those who had not had the benefit of sensorimotor training in prekindergarten, as well as for those who had received such training in the ECE program. It was also recognized that the early advantage for preschoolers might not continue through kindergarten and the first grade. The report at the end of Phase I added this pertinent evaluation regarding the residual effects of sensorimotor training:

> **There is a possibility, of course, that the early advantage for preschoolers may be**

Phase	Age Level To be Tested	Groups Tested	Purpose
1967-68	Prekindergarten (4-year-olds)	Experimental group in ECE being given sensorimotor training; control group in MVCDC centers receiving no specialized training in this field	To determine the effect of 7 months of training in sensorimotor areas during prekindergarten
1968-69	End of kindergarten year (5- to 6-year-olds)	Same individuals from the experimental and control groups as above	To determine if effect of sensorimotor training continues through kindergarten, or is obscured by effects of maturation
1969-70	End of first year of school (6- to 7-year-olds)	Same individuals from the experimental and control groups as above	To determine the relationship, if any, of early sensorimotor training to first grade achievement

submerged within the next year or two of kindergarten and first year of school. If this should happen, then, based upon the results of Phase I, the rationale for sensorimotor training could still be applied: that a child's preschool training in body awareness and in the developmental sensorimotor skills do provide natural activities, involving many successes, and that this training gives him, in the beginning, a sound base upon which to build the perceptual skills which will be needed in future classroom activities.

Conclusions from Phase II of the Study

Similar null hypotheses were advanced to correspond to those of Phase I.

1. In sensorimotor performance (according to the locally developed survey), age levels, or maturation, still had a significant effect.
2. Treatment, or early preschool training in sensorimotor performance of the experimental group, maintained a significant effect at the end of the kindergarten period.

CONCLUSION OF PHASE III

At the end of Phase III, Gray's Oral Reading Test and Wepman's Auditory Discrimination Test were administered to the remaining matched pairs of children. Due to attrition, the original 76 matched pairs had now dropped to 42.

Although the research findings have not been fully tabulated, indications now seem to show that there will be no significant difference between the experimental and control groups in reading ability. There is evidence, however, that the experimental group does have a better comprehension of listening skills.

The variation in reading ability is due to many factors. The study was evidently affected by the types of reading programs used by the many different first grade teachers. If the same type of reading programs had been used, perhaps the findings would have given a truer indication of all of the children's ability to read.

A more extensive study should be made along these lines, measuring self-concept and overall school achievement, rather than just reading and listening ability. A more sophisticated sensorimotor survey should also be administered at the end of the first grade to measure the carry-over value of early preschool training.

MULTIDISCIPLINARY APPROACH

During the year, all of the four-year-olds were given a thorough physical examination at Children's Medical Center. At this time, recommendations were given by the staff if it was indicated that the children had physical handicaps that could affect learning ability.

During the last year, after examinations by optometrists, four children were given additional sensorimotor training. One child who suffered a neurological handicap, determined by an EEG, was also given additional training.

Conclusions

We have been discussing the effects of sensorimotor training as a means of increasing perceptual acuity, which would perhaps thereby lead to greater learning ability in the primary grades. This is not a new theory that we are talking about. Let us look briefly at some of the theories that were advanced in the educational field many years ago.

First, Comenius, who lived from 1592 to 1677, stated, "Education should proceed in the following order: First, educate the senses, then the memory, then the intellect. The child first perceives through the senses, these perceptions are stored in the memory, and called up by the imagination." (3) He also stated:

> The constant activity of children must be provided for. It is better to play than to be idle, for during play the mind is intent on some object which often sharpens the abilities. In the third, fourth and fifth years, let their spirits be stirred up by means of agreeable play—if some little occupation can be conveniently provided for the child's eyes, ears and other senses, these will contribute to its vigour of mind and body (3).

Rousseau, who lived from 1712 to 1778, stated:

> As everything that enters the mind finds its way through the senses, the first reason of a human being is a reason of sensations; this it is which forms the basis of intellectual reason; our first masters in philosophy are our feet, our hands, our eyes. That we may learn to think we must then exercise our bodies, our senses, as these are the implements of our intelligence and that we may make the most of these implements, the body which supplies them must be strong and healthy (3).

Upon examining these theories, we find that sensorimotor training is not new. I wonder, then, where along the line we educators forgot the implications of this type of training. It is necessary for us to constantly re-emphasize the need for this type of training. We must continue to share ideas, programs, and research so that all people involved with children—teachers, administrators, and members of other disciplines—will become more aware of how children may be helped to realize their full potential.

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ACTION PROGRAM: MOTOR-PERCEPTUAL MOVEMENT PATTERNS

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Rationale

More and more children are growing up in apartments with unnatural limitations upon their movements. They have fewer opportunities for the free bodily movement they need to achieve maximum health. In spite of their strong, natural inclinations to move and explore, they live in a push-button world that requires little physical effort, but which does require a lot of technical know-how. Experts have proved that there is a definite relationship between a child's physical development and his ability to learn. One expression you will hear repeated is, "All learning comes through movement and all movement must be learned."

We have developed an action program called Motor-Perceptual Movement Patterns. This program is based on theories and ideas from experts, such as Piaget, Montessori, Getman, Frostig, Doman, Delacato, Godfrey, Arner, and others. The program has been in use at Jefferson School, LaCrosse, Wisconsin, for five years. Although the program has benefited all of the students, it has especially helped children who had not been reached by traditional methods.

General movement patterns needed by children sometimes do not develop without guidance. Thus, motor-perceptual activities need to be taught which will aid neurological development.

Objectives:

1. To teach the basic motor-perceptual movement patterns.
2. To teach these movement patterns in sequential order based on the stages of child development from birth on.
3. To acquaint parents, teachers, children, and others with the need for this training and to enlist their assistance in developing movement patterns.

The classroom teacher and the physical education teacher carry out the program. It also involves the school psychologist for testing, the principal for public relations, the social worker for liaison, pediatricians and optometrists for consultants, and parents for reinforcement.

[Editor's Note: A series of slides was presented. The following is the verbal presentation which accompanied the slides] Slide 1 etc.

Slides

No. 1: This program, Motor-Perceptual Movement Patterns, has been developed from theories and ideas of experts involved in helping children learn. It is a unique program because it is for all children, not just slow learners or children who have difficulties in learning. It follows the sequence of movements as a child learns them from infancy to school age. Learning takes place through all the senses of the body.

No. 2: Experts in the study of children have proved that there is a definite relationship between a child's physical development and his ability to learn. All learning comes through movement and all movement must be learned. Our culture today deprives or minimizes opportunities for maximum development of movement. Children ride instead of walk; they spend many hours sitting and watching television; their play areas are often limited; babies may be kept in playpens or walkers instead of being allowed to creep and move about freely. Many parents push their children in order to have them mature more quickly—they feel proud when a child walks without creeping. Yet creeping is one of the most necessary stages of development.

No. 3: Children may arrive in the classroom lacking some of the basic movements necessary to do abstract learning, that is, using letters for reading and numerals for arithmetic. This program was developed to help children become physiologically and psychologically ready for abstract learning. The program is divided into six areas of movement, as named by Getman.

These are:

No. 4: General movement patterns

No. 5: Specific movement patterns

No. 6: Eye movement patterns

No. 7: Communication patterns

No. 8: Visualization patterns

No. 9: Visual perceptual organization. These are interrelated areas and develop simultaneously, but they are discussed separately to help understand neurological development.

No. 10: The first movements help the infant learn about himself, his body parts, and how they will help him learn about his world.

No. 11: These are *general movement patterns.* The next slides show some of the activities used in the program to build and reinforce general movement patterns.

No. 12: When a child is born he usually has the tonic neck reflex, that is, when his head is turned, it flexes the arm and leg on the side toward which the head is turned. The child uses this movement pattern to do the one-sided (homolateral) movement of crawling. After a child reaches the creeping stage, the pattern vanishes. However, it does remain a part of the nervous system. It can be noted in the sleep pattern of a child who is well developed neurologically. This slide shows the sleep position. Doing the flip-flops, that is, alternating from right side to left side while in the sleep position, helps strengthen the tonic neck reflex movement. The next stage of development is creeping.

No. 13: This is the child's first mobility function that requires a cross-pattern movement – the right arm moves forward with the left leg, and the left arm moves with the right leg, as shown here. The head turns toward the forward hand.

No. 14: To help children learn laterality and increase the control of their own body movements, an activity called "angels-in-the-snow" is used. The children lie flat on their backs on the floor with arms at sides and feet together. Arms are moved along the floor with elbows straight until hands touch above the head. Then arms return to starting position. Legs move as far apart as possible, keeping knees straight but not stiff. Movements of arms and legs are combined.

No. 15: Single limb movements and various combinations of limb movement are practiced. Children's ability to control and synchronize their body movements in this routine makes them more capable and efficient in other movement patterns.

No. 16: Stomach and back muscles need strengthening. Rolling, sit-ups, feet lift, and push-ups develop back control and flexibility. The end result desired in this program is freedom of movement and coordination, *not* muscular strength.

No. 17: The following slides are general movement patterns that help develop a child's balance and his relation to space.

No. 18: A balance beam (or walking board) is being used to emphasize the interrelationship of body sides. There are many different ways of using this piece of equipment. This picture shows three variations. The body balance that develops as a result of the balance beam used is evident in total body posture.

No. 19: Balance bars have many and varied uses. In this picture the girl is doing forward cross-pattern creeping.

No. 20: Here the boy has turned himself "inside out" and is moving both forward and backward on the bars.

No. 21: This way of developing balance emerged from each child hanging his mobile in our classroom. A child is encouraged, but never pushed, to go beyond where he feels safe in climbing the ladder. Looking down on things gives a child a new perspective of his world. Have children look down from balconies, overheads, and other high places.

No. 22: The trampoline is an excellent device for developing total body coordination. Our school did not have a trampoline, so we improvised by putting a mat on a bedspring.

No. 23: Rhythm, a necessary part of the movement patterns, is taught by many activities both with and without music. Here the children are doing one of their favorites–a simple square dance called "Around the Corner."

No. 24: Using a doll aids in learning parts of the body. Finding parts of the body with eyes closed and by using rhymes are other variations. Since the body is the point of origin for all movement and interpretations of outside relationships, the training of body image is considered an important part of this program to aid neurological development.

No. 25: From general movements of all the parts of the body children derive *specific movement patterns* to control and manipulate the things of their world.

No. 26: Hands are man's special tools, they are used in almost all manipulating skills. Here we see a child building figures and designs with sticks. Using other small objects such as pegs, buttons, and kernels of corn is good training for hands and fingers. It helps develop the prehensile grip, i.e., the grip between the thumb and the first finger.

No. 27. All ball skills require special movement patterns. Bouncing, catching, throwing, and keeping the eyes on two balls are demonstrated by the youngsters here.

No. 28: Ball skills and balance beam activities are combined to develop dynamic coordination of several major muscle groups.

No. 29: Feet, too, need training. Eye-foot coordination is developed by controlling balls completely with the feet.

No. 30: Playing jacks is an excellent activity for teaching eye-hand coordination. Many variations for playing this game have been devised. This game is usually too difficult for children younger than third grade.

No. 31: The yo-yo is another toy which requires special movement patterns.

No. 32: The body develops from head to foot and from the center out. Little rhymes giving fingers names make it fun to move one finger at a time. Fingers are sometimes held straight out (flat) and sometimes in a hooked position, like typing. If one finger cannot be controlled or moved, the other hand is used to move it.

No. 33: Finger drills help develop muscles needed in writing. Notice the correct position of the paper and of the body as shown here for both left-and right-handed writers.

No. 34: Experience and practice in *eye movement patterns* assist children to obtain information visually. A planned program for eye training is essential to complete neurological development.

No. 35: Ocular pursuit means following a moving object, as shown in the chalkboard game of connecting the dots.

No. 36: Another kind of visual pursuit is shown in this slide. First the child follows a target moved by himself, then another child moves the target. The target should be moved in straight horizontal lines, straight vertical lines, diagonal lines, and circles.

No. 37: The device shown here lets a marble roll in zigzag fashion, from the top to the bottom. Children watch the marble roll with both eyes or with one eye covered. Left to right progression is essential for adequate reading skill.

No. 38: The Lazy 8, being drawn in this picture, helps overcome the midline problem. Some children's eyes do not move smoothly when crossing from one side of the body to the other or when moving up and down. Peripheral vision, or seeing out of the corner of the eye, and accommodation, or seeing both near and far, are two other eye movement patterns that need to be taught.

No. 39: Hearing, vision, and vocal noises are combined to communicate. Tongue exercises are used to aid speech. The development of *communication patterns* requires training for special movements of muscles. Complex control of muscles of the lips, mouth, tongue, and throat is needed.

No. 40: Following directions such as, "Hands on your hips, hands on your knees, put them behind you if you please" and "raise your hands up on high and make your fingers quickly fly," helps develop communication. The game "Simon Says" uses this approach.

No. 41: Visualization patterns are substitutes for action, speech, and time.

No. 42: With heads down and eyes closed, several things can be done, such as: following directions, pointing to where a sound is heard, recognizing a classmate by his voice, and pointing to where things are located in the room.

No. 43: Playing checkers is one way of "looking ahead" mentally before making crucial moves.

No. 44: All these movement patterns lead to *perceptual organization,* that is, readiness for interpreting symbols.

No. 45: Changing symbols such as maps, formuli, signs, letters, and numerals into speech and action is the highest process in the development of man's intellectual capabilities.

No. 46: These slides represent a random and partial selection of motor-perceptual movement patterns. It is hoped that they have given you an incentive to study this new way of helping children learn, and that you will devise other activities to develop motor skills.

Assessment Instruments

The preferred assessment instrument is Kephart's Perceptual Rating Scale with some additions, as given in our booklet, *Motor-Perceptual Movement Patterns.*

Frostig's Developmental Test of Visual Perception is good. Also, this year a study was conducted using the Gray Oral Reading, the Stanford Achievement Test, and the Weekly Reader Silent Reading Tests.

Results

The tests used in the study showed a positive relationship between achievement and comprehension and improvement in motor-perceptual activities. To help interpret results of the motor-perceptual tests, the performances were rated. Then the raw data of improvement was arranged in rank order, and coefficient correlations were computed by the Spearman Rank Order Method. The coefficients were high enough to suggest that there was a positive relationship among academic and motor-perceptual performance and progress.

Although not measured, there were unexpected and rewarding results from the study in the marked psychological changes in most pupils. Antisocial aggressive behavior disappeared. Initiative and self-confidence improved. Nervous movements such as pencil tapping, excessive wriggling, talking, and whistling ceased after a time of motor-perceptual training. Ability to get along with other children was improved. Students with high achievement scores, as well as those with low scores, benefited.

Demonstration With Children

A few activities for each area of development, as described in the slide-tape presentation, were demonstrated with the children.

A MULTIDISCIPLINE APPROACH TO THE DEVELOPMENT OF VERBAL AND READING SKILLS

A Study of One Class of Pupils from a Low Socioeconomic Level Kindergarten through First Grade

February 1968 through June 1969

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Many inner city and fringe inner city pupils of low socioeconomic level show poor achievement in communication skills. As these pupils move through the elementary grades, the span between achievement in these skills and the norms for their grade widens. This creates many problems for pupils, schools, parents, and community.

Efforts to help these pupils use their school experiences have pointed up the critical importance of the earliest school years. This is when children begin to develop attitudes toward learning which will affect significantly their future use of educational programs. Perceptual-motor lags; minimal neurological dysfunction and economic, social, medical, and emotional problems, if not recognized at this early stage, can lay the foundation for future school difficulties, which will ultimately result in school dropouts. These problems are not discrete entities; rather, they appear in various combinations, each interacting with the other.

Because of the complexity and interrelationship of the factors that can impede a pupil's use of an educational program, we believe a multidiscipline approach is necessary for effective help. We were particularly interested in evaluating the contribution that a closely coordinated physical education and school social work program can make to pupils' progress in verbal and reading areas. To explore this we planned the following project, which coordinated:

1. The *instructional program.*
2. A *physical education program* specifically oriented to:
   a. General motor and perceptual-motor development
   b. A remedial program for pupils who have perceptual-motor dysfunction.
3. A *school social work program* oriented to:
   a. Early identification of and treatment for pupils evidencing problems or who have backgrounds fostering incipient problems that can handicap their educational progress, such as central nervous system dysfunction, a strained child-parent relationship, or situational and/or emotional problems.
   b. Improvement of the teaching–learning climate for the whole class through assistance to disruptive and inappropriately placed pupils, thus freeing the teacher to use her time for teaching.
   c. Work with parents to help them accept and support the school program, thus increasing their contribution to their children's education.
   d. Appropriate involvement of other disciplines such as medical, psychological, and psychiatric.
4. A *testing program* administered by school and educational psychologists, senior teachers, and other school personnel.

Procedure

Two kindergarten classes of 20 pupils each were randomly selected in an inner city school.

This was a model school with small classes and abundant services. Both classes were taught by the same teacher and followed the same instructional program. The morning class was used as the control group and the afternoon class was the experimental group.

The classes remained intact during the first grade and received the same instructional program. In first grade, efforts were made to select two equally competent teachers. To measure more accurately the contributions of the physical education programs described previously, the classroom teachers did not alter their usual instructional program. The school social worker shared data freely and worked closely with the teachers. To implement the plan, the experimental class received the full services of the school social worker and the physical education teacher.

The school social worker's contribution to the team approach was her immediate availability for help in early identification, diagnosis, and treatment. Positive parental involvement was stressed.

Evidences of overprotection, immaturity, lack of control, emotional problems, physical problems, developmental lags, and retardation, as reflected in the classroom and/or gymnasium, were discussed in social worker-parent conferences. The focus was on understanding the factors contributing to the pupils' problems and finding ways to help. It was felt that these conferences would stimulate a change of attitude and approach to the children, as well as a more appropriate use of school and community resources. Also, pupils were given direct casework help when appropriate.

Consultation was offered to the classroom and physical education teachers concerning the behavior and participation of individual pupils as well as their relationship with peers and parents. Some of these discussions were initiated by the classroom or physical education teacher; others were introduced by the social worker on the basis of her observations in the classroom and gymnasium and/or contacts with the parents. Referrals to the social worker for ongoing help were formalized through the teachers and principal. Efforts on the part of the social worker to encourage more meaningful parent-school relationships were stressed. Except on an emergency basis, the social worker's services were not made available to the control group.

The physical education teacher met the experimental class daily for 30 minutes. The entire class received a sequential, developmental physical education program following the curriculum guide for early elementary physical education for Baltimore City public schools.

Self-testing activities, games, and rhythms were taught, but particular emphasis was placed on activities which contribute most to perceptual-motor development. This daily instruction plan was followed for a half year of kindergarten and approximately three-fourths of the first grade.

At that time, through joint conferences of the physical education teacher and the social worker, nine children, who still showed marked deficits on the Purdue Perceptual-Motor Survey and other test data, were selected to receive intensive help. For the last quarter of the school year, the entire class continued to receive physical education instruction only twice a week. The selected group of nine received intensive, remedial physical education on the other three days. The program planned for the special group was based on the works of Kephart, Cratty, Frostig, and others. This involved the improvement of balance, body image, ocular control, and perception of figure-ground relationships. Development in these areas was emphasized because they are important prerequisites to learning to read.

The control group received the usual physical education program weekly. No emphasis was placed on perceptual-motor development.

The above outlined approach was obtained throughout the 1½ years of this project. Emphasis was placed on periodic joint physical education teacher-social worker conferences which brought together information about classroom, home, hospital, test data, and other materials relevant to the evaluation of the progress of each pupil in the experimental group. These conferences helped in the formulation of a consistent, unified approach to further help individual pupils.

The following situation illustrates the use of the multidiscipline approach:

John, a kindergartner, was referred to the school social workers by the classroom teacher shortly after the project was initiated because he was said to be "immature, aggressive, and a severe attendance problem." His mother had not been responsive to the teacher's efforts to reach her.

The social worker began to explore the situation. In a conference with the physical education teacher it was noted that John showed a similar pattern of behavior in the gymnasium. His scores on the Purdue Perceptual Motor Survey test pointed up marked deficiency in the areas of body image and form perception. On the WPPSI, John scored in the average range of intelligence.

Further exploration revealed a neglectful home situation with only one parent, his mother. She was somewhat limited mentally, and was supported financially by the Department of Social Services. John's mother was responsive to the social worker's expression of the school's concern about her son. Within a short time she was able to trust the worker sufficiently to share, with relief, her own problems with John. She could not get him to obey her and this caused much tension at home.

As the social worker helped John's mother to assist him in coming to school regularly and in achieving more self-control, the classroom and physical education teachers coordinated their efforts sensitively in these same directions. During this time, the social worker held individual interviews with John to discuss his behavior and attendance. In his own way, John expressed concern about his troubles and became actively engaged in trying to do something about them.

In this situation, it was not necessary to involve special medical help or additional psychological evaluations. A joint conference several months later, at the end of the kindergarten year, revealed that the improvement John's mother was feeling at home was reflected also in John's school behavior and attendance.

The following September, John's class moved to a first grade teacher. Shortly thereafter, joint conferences were held to assess the academic and behavioral status of each pupil in the class. John's attendance and behavior were continuing on a satisfactory level. However, his achievement in physical education and reading readiness was lagging. Although of average intelligence, in reading readiness he ranked fourth from the bottom in a class of 20. The Purdue Perceptual Motor Survey retest revealed little progress in the areas of body image and form perception. The Primary Mental Abilities test showed marked deficiencies in the perceptual, numerical, and spatial areas. It was decided at the conference to place John (along with eight other pupils in the experimental class) in a special group to receive remedial help from the physical education teacher.

In June 1969, in a final joint conference at the end of the first grade, a review of John's situation revealed that his attendance had remained at a satisfactory level, and his aggression, both in the classroom and the gymnasium, had decreased markedly. His mother continued to be effective in support of his efforts.

The Primary Mental Abilities posttest evidenced striking progress in the perceptual and spatial areas. The SRA reading level program indicated that he had moved two levels in reading, which was the average progress of the experimental group. We feel that because John was helped to come to school more regularly and to establish inner controls, he was more "available" psychologically to attend to and benefit from the classroom and physical education programs. Significantly, the spurt in his reading development occurred after his placement in the remedial physical education program.

Study Test Results

The basic purpose of this study was to discover how the multidiscipline approach involving physical education and school social work would affect pupil growth in verbal and reading areas. The test data revealed the following:

1. *Verbal Achievement*
   a. On the Bettye Caldwell Pre-School Inventory, which is an expressive verbal test, the average raw score of the experimental class showed double the amount of growth of the control class.
   b. On the verbal part of the Primary Mental Abilities test, the average raw score of the experimental class increased 7.8 points, while the average raw score of the control class increased 6.8 points—a difference of 1 point.
2. *Reading Achievement*
   According to the tests accompanying the SRA reading program, in the period between January and June 1969, the experimental class moved an average of *two* levels while the control class moved an average of *one* level. Of the nine pupils who received two months of intensive remedial physical education, eight progressed two reading levels. The ninth pupil progressed from Low A to B—better than one level.

There were positive parental attitudinal changes toward the school as a result of the parents' involvement in their childrens' school program.

Conclusion

The test data indicate that the progress of the experimental class in the verbal and reading areas was considerably greater than that of the control class. An important part of this difference in achievement can be attributed to the highly coordinated efforts of the social worker and physical education teacher, the help of the classroom teacher, and the use of appropriate resources.

This study ended in June 1969. As of September 1969 the classes were no longer kept intact. The pupils were placed in different classes in the same school and some had moved and were in different schools.

In Baltimore, city-wide reading tests were given to all second grade pupils in the spring of 1970. Without further special help, the experimental group sustained its significant gain over the control group. The median reading level of the control group was one year, eight months, while the median of the experimental was two years, eight months.

As mentioned previously, the involvement of the classroom teacher was held to a minimum in an effort to evaluate more accurately the contribution of the social work and physical education disciplines. When the teacher's involvement is no longer restricted by the guidelines of the study, her additional valuable contributions will produce even greater pupil growth.

Interaction, which is the core of the multidiscipline approach, results in a quality of assistance to pupils far greater than the combined contribution of the individual disciplines. The project data strongly suggests the value of wider implementation of the multidiscipline approach beginning at the earliest school level with full participation of all the disciplines involved.

The following school personnel had a major part in implementing this study: Classroom teachers: **Rubye Mangum, kindergarten**, and **Rosalie** Gresham, first grade. School social workers: Geraldine Long (Feb. '68-June '68) and Willnetta Sutton (Sept. '68-June '69). Physical education teacher, Daniel Sardeson.

TESTING PROGRAM

KINDERGARTEN

September 1967 – June 1968

February 1968	**Pretest**	**Purdue Perceptual-Motor Survey (Motor Part) – Kephart and Roach**
March 1968	**Test**	**Wechsler Pre-School and Primary Scale of Intelligence (WPPSI)**
June 1969	**Posttest**	**Purdue Perceptual-Motor Survey (Motor Part) – Kephart and Roach**

FIRST GRADE

September 1968 – June 1969

September 1968	**Pretest**	**Primary Mental Abilities Test – Thelma Gwinn Thurstone**
October 1968	**Pretest**	**The Pre-School Inventory – Bettye M. Caldwell**
January 1969	**Level Achieved**	**Reading Program – Science Research Associates, Inc.**
June 1969	**Posttest**	**Primary Mental Abilities Test – Thelma Gwinn Thurstone**
June 1969	**Posttest**	**The Pre-School Inventory – Bettye M. Caldwell**
June 1969	**Level Achieved**	**Reading Program – Science Research Associates, Inc.**

THE TEAM APPROACH TO HELP – THE WINTER HAVEN STORY

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The child-centered activities sponsored by the Lions Research Foundation, Inc. of Winter Haven, Florida are known as *The Winter Haven Story*.

The Winter Haven Program, or by its new name, "The Florida Lions Project HOW TO HELP A CHILD," focuses upon certain basic perceptual testing and training methods and procedures that might be expected to aid kindergarten and first grade students who have not responded at, or near, their expected classroom achievement level when standard instruction has been provided. These children cannot, by any classification, be labeled mentally retarded, yet they fail to achieve in the classroom *learning-to-learn* skills because of functional, maturational, visual, perceptual, social, and/or emotional difficulties.

Many of these children respond favorably to the basic perceptual testing and training methods that have been used over the years in the Winter Haven Story Program. A large number of these children who exhibit "perceptual-stress" fall under the same general category as described in the California "Waldie Bill's" definition of an educationally handicapped child. The Waldie Bill's definition is:

> A child not physically handicapped or mentally retarded, whose learning problems are associated with a behavioral disorder or a neurological handicap or a combination thereof, *and who exhibits a significant discrepancy between ability and achievement.*

In the California report, estimates of the proportion of children in the category vary from 5 to 20 percent of the entire school population.

Clearly, new methods have to be devised to teach these youngsters who are not responding to typical workbooks, lesson plans, and educational methods.

New programs of classroom enrichment often frustrate rather than inspire these children. Old methods of drill and memorization often increase their hostility and inability to learn. Why?

Writing from the Institute of Research on Exceptional Children at the University of Illinois, Dr. Barbara Bateman said:

> From a selfish vantage point, I think that educators are, and ought to be, watching with a very sharp eye what we do with the child with learning disabilities for this reason: *this child is going to teach us more about learning than all the rats in the mazes and all of the college sophomores or memory drums ever did.* He simply won't learn if we persist in violating the basic principles of learning.
>
> The normal child can achieve up to grade level on his Stanford Achievement Test even if we never do anything right in the classroom. He will learn in spite of us; but the child with learning disabilities won't, and it is through him that we are going to learn more about learning.

Education is becoming increasingly aware of the importance of body balancing and counterbalancing in determining the "motor-readiness" of children as they face the various near-at-hand performance tasks expected of them in kindergarten and first grade. A large share of any child's "learning-readiness" is associated with his balancing and counterbalancing activities. These acts come under the technical heading of "motor-equivalence."

These procedures will be detailed later. They are simple to do, as well as easy to understand and demonstrate to parents.

As Harmon stated so well:

> The child at birth is neither complete in size nor in structure of his bodily systems. The primary task for a child is to grow. This *growing-up* is a continuing process of developing to a physically mature state.
>
> From birth to maturity, the child, from a dynamic point of view, is constantly undergoing alteration in his growth and development. Any environmental situation having to do with a "growing-up" child which distorts or delimits the growth and/or devel-

> **opment of the "total" child may have a definite effect on his learning skills later on. It is now widely accepted, both professionally and educationally, that well planned motor activities can and do play an important role in a child's intellectual development (3).**

The February 1963 issue of *The Nation's Schools* contained an article by its editor, Arthur H. Rice on the Winter Haven Story Program, *"Rhythmic Training and Body Balancing Prepare Child for Formal Learning."* The article offers the following points:

> 1.–A convincing demonstration of how potential "low achievers" in the first grade can be identified by predictive tests.
>
> 2.–Astounding evidence of the value of rhythmic training, especially work with geometric forms, as preparation for formal learning in reading, arithmetic, spelling, and other communicative skills.
>
> 3.–An example of a modern approach to applied research in education through a synthesis of disciplines.
>
> 4.–A commendable example of how civic, educational, and/or commercial interests can team up and ethically finance a program of basic research in education (5).

Under the heading, "What is the meaning of readiness?," Dr. Rice states: "Readiness for formal learning is more than a product of sheer growth. The child first must be taught literally to learn to get 'ready' for the more formal experiences in a course of study."

Several investigators have shown that if beginning school children are given guided experience in drawing elementary forms such as circles, squares, and triangles, their readiness for more complex form recognition tasks, such as reading, is advanced significantly (5).

Similar ideas were expressed by Dr. Mary Bosworth in her doctoral report, "Pre-reading: Improvement of Visual Motor Skills." In her summary, she poses the following questions and answers:

> Q.: Can the ability to copy selected geometric figures be improved by training?
>
> A.: The ability of kindergarten pupils to reproduce selected geometric figures is amenable to training.
>
> Q.: Does the training procedure improve the ability to discriminate words?
>
> A.: Word discrimination ability is, in turn, improved by training in the reproduction of selected geometric figures (2).

At the opening session of a recent week-long summer seminar sponsored by the Winter Haven Lions Research Foundation, Polk County School Superintendent, W. W. Read, made the following statements:

> **Perceptual testing and training procedures should be regarded as a "tool" that can be used by teachers in helping children, and most especially children in the kindergarten and first grade who are having difficulty in achieving to their "potential," learning-wise and in organizing their visual-motor skills in a more meaningful fashion.**
>
> **Educators across the nation have been watching with great interest this team-approach project sponsored by the Winter Haven Lions Research Foundation, not only because of what it has evolved for education, but also because it shows what citizens, service clubs, and parents can do when they combine their efforts and their resources together in a basic child-oriented project aimed at a specific goal.**
>
> **Perceptual training is, as I said earlier, a "tool," a valuable tool, that can be used by educators to help children in "Learning-to-Learn."**

The Winter Haven Story Program embraces the concept that, through the classroom use of certain basic Lion-sponsored perceptual testing and training methods, primary school teachers have still another teaching tool that can prove to be both useful and reliable.

The suggested procedures making up the program were designed to supplement presently used primary procedures. This basic testing, teaching, and training tool can provide additional aid for primary youngsters who find it difficult, if not impossible, to achieve at a satisfactory level, even though their permanent school records indicate that they have the ability. For some reason, these students fail to organize their classroom learning experiences to a degree that would allow them to build basic perceptual and visual-motor skills. These skills are needed to establish a firm foundation for basic learning skills.

The reasons why a primary student fails to adequately organize these basic learning skills may stem from developmental factors, such as maturational, functional, visual, emotional, physical, and/or social difficulties. These factors may cause the development of a potential perceptual problem, which can limit a beginning student's ability to achieve at or near his maximum learning potential.

To answer the frequently asked question of whether the Perceptual Forms Test can be used to predict reading ability, the following remarks by George Spache, Head of the Reading Laboratory, University of Florida, are quoted from a procedure manual Dr. Spache authored for the Lions Research Foundation:

> **It is desirable to point out that this test (the Perceptual Forms Test) is not intended for use as a specific Predictor of reading ability–it will not separate children into those who will be slow learners and fast learners in the classroom. . . Its most proper use is to identify those children who are likely to experience problems in general school achievement which may be due to**

"*perceptual-difficulties.*" The research accumulated in this type of training may enable such children to achieve a greater degree of success than if they had been permitted to enter formal reading instruction without it.

The first of four graduate studies that have been sponsored by the Lions Research Foundation to date took place at Purdue University under the direction of N. C. Kephart. In Robert G. Lowder's dissertation, "Perceptual Ability and School Achievement," he indicated that a small but positive correlation existed between the manner in which a youngster copied the basic geometric forms and his classroom achievement. In his conclusions, Dr. Lowder posed several questions:

1.– Since outline form seems to be a learned developmental phenomenon, will formal, systematic perceptual training result in improved school achievement in the beginning grades?
2.– Would children profit more from training in basic perceptual skills during the first year in school than from conventional instruction?
3.– Does the present controversy over the relative rights of teaching lie in the more basic problem of development of perception? (4).

The Lion sponsored perceptual testing and training program might be considered another means of helping a beginning school child to organize and reinforce the following perceptual factors. These factors seem to have some relationship to kindergarten and first grade students' ability to engage effectively in many common classroom tasks.

COPYING: Copying will aid in strengthening the child's total perceptual skill.

MATCHING: This factor can be used in reinforcing the perceptual skill needed in matching size and length, as well as positioning items in space.

SIZE CONSTANCY: Template training can be a positive aid in reinforcing the child's perceptual ability. It is needed to reproduce the various items that are part of the total task so the relation of the overall size can be maintained.

ORGANIZATION: Template training can assist a beginning student to assemble the items making up the whole so that the end result becomes a still more meaningful whole.

VISUAL MEMORY: Template training can aid the beginning student in reinforcing the perceptual image of the copied items so they can be recalled, projected, and reproduced with reasonable accuracy.

EYE-HAND-MOTOR PERFORMANCE: Organized and directed template training can improve the child's visual-motor performance as a more efficient degree of coordination in the beginning student's neuromuscular patterning takes place. While the degree of change is more dramatic in the slow learning group, whose copied work samples contain the greatest distortions, data tend to support the idea that even the highest achieving children in the class perform with increased virtuosity after the organized classroom use of these simple perceptual template training activities.

VISUALIZATION: An important resultant of template training shows that a pupil learns to *visualize* how one form can be made into other forms through the addition of just a few lines. As Bender has stated, "It is not necessary that a resemblance needs to exist between the form and the 'interpretation' given it by the child" (2).

As long as the form can carry out the role given it by the child, the form or drawing, even though it is distorted, becomes a carrier of meaning.

It is the hope of the Winter Haven Lions, as well as the Lions of Florida, that as this very basic perceptual testing and training program spreads, still other Lions Clubs and schools will become part of the team approach to HELP A CHILD.

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REMEDIAL READING CAN BE PREVENTED

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This report concerns a program that was conducted in Eugene, Oregon. The program is entitled *A Perceptual Development Program*, and is a combination research and demonstration project. A two-year pilot research project has just been completed under the auspices of Title I of ESEA. The demonstration project is funded under Title III of ESEA and the research is being continued under the combined funding of Title I and Title III.

The pilot program consisted of two first grades, two second grades, and one combination first and second grade in three schools. Four elementary schools served as control schools. The project consisted of seven first grades and three second grades in six schools with five control schools.

The project focused on two objectives. The first was the identification, at the beginning of first grade, of children who were likely to have difficulty in learning to read. These children were classified as potential reading failures. The instrument used to identify these children was the Predictive Index Test. This test was developed by Katrina deHirsch, Jeannette Jansky, and William Langford after approximately 20 years of research and was published in their book *Predicting Reading Failure* (Harper & Row, 1966).

The original test takes about two hours to administer. In a clinical setting such as theirs this was feasible, but when testing from 500 to 600 children in the field, such timing is prohibitive. The test was shortened so that it could be administered to a child in 20 to 30 minutes. It was found to be about as effective as in the original form. Dr. deHirsch has since modified the test a great deal in the last year or two.

The test consisted of seven subtests. These included a *Horst Reversal Test* in which the child was asked to pick from several symbols in the line the symbols which are the same as the one that the examiner identifies in the first column. All of the test, except the first line, is shielded at the beginning. After the examiner was certain the child knew what to do, he was told to do the rest of the page by himself.

In the second subtest, the child was given a blank sheet of paper and was asked to reproduce some Bender-Gestalt forms. This is a modified *Bender-Gestalt Test* and a *Pencil Use Test.* While the child was doing the *Bender-Gestalt,* the examiner watched his use of the pencil and scored him 0, 1, or 2 on the basis of his pencil manipulation. The parts of the *Bender-Gestalt* that we used were the A, 1, 2, 4, 6, and 8 cards out of the original 9. The 3, 5, and 7 cards were omitted.

The next subtest was a modified *Wepman Auditory Discrimination Test.* The original *Wepman Test* had 40 items; this test used every other item, thus shortening it. The score was the number of errors in the X column; that is, the score was computed only on the pairs that were different and not the ones that were alike.

The next subtest was a modified *Gates Word Matching* subtest where the child had to identify the two words in the box that were the same and draw a line between the two.

The sixth test was a category test where the child was asked, "What are these things–red, green, and blue?" and he was supposed to give an answer of "colors." Next the child was told: "I am going to change the second item in this test that uses the words 'Tom, Henry, and Charley' with an answer of 'boys.' " There were three correct answers. The answer of "names," "boys," or "men" was acceptable; "people" was inacceptable.

The last or seventh subtest was recognizing and reading letters and numerals. The examiner pointed to each letter or numeral and asked the child to identify it. The score was the number of items missed. Each one of these subtests had a critical score level. Katrina deHirsch set up certain score levels, or critical scores for each test. The *Pencil Use Test* had a critical score of zero; the *Bender-Gestalt's* critical score was one; and the *Auditory Discrimination Test,* one. The original test had a "number of words" test, but this was omitted because it was difficult to administer and did not supply enough information to compensate for the time it required. The *Categories Test* had a critical score of zero; the *Reversal Test* allowed four errors; and the *Word Matching Test* allowed three.

In the seven subtests, if a child failed five or more subtests he was considered a potential reading failure. There was a continuum or range from best to poorest. The child who failed four subtests was just over the borderline and needed assistance. The focus of these tests was on perceptual development. There was practically no measure of intelligence in these tests. Many children with high I.Q.s failed five, six, and seven of the subtests. At the same time that this test was administered, a *Peabody Picture Vocabulary Test* was given to determine a good "guestimate" of the I.Q.s. It seemed probable that the children with high I.Q.s who failed five, six, and seven of the subtests were the ones whom teachers in the past had often pointed out as being able but unwilling. One often hears, "Johnny could do it if he *would*." The statement should be "Johnny would do it if he *could*." Johnny probably has perceptual problems and cannot learn, but the teacher, not recognizing perceptual problems, thinks Johnny doesn't *want* to learn. We are finding that as soon as Johnny overcomes his perceptual problems, he is eager to learn.

The second objective of this program was to give the child perceptual development training during the first and second grades to help him overcome his perceptual problems. The first and second grade curriculum was taught using perceptual development techniques. Such techniques have been developed by a number of people or projects throughout the United States during the past 15 or 20 years. Examples of these people and/or projects are Frostig, Kephart, Getman, Engleman, Slingerland, Benyon, Montessori, and the Winter Haven program.

All of these programs are good in certain areas. However, taking parts of each program and adapting them to the needs of the child seemed more effective. Several teachers have worked on this project for 2½ years and assisted in developing a handbook for teachers and parents who are interested in perceptual development. This handbook is used as a guide for teaching these classes. Books and articles published by researchers and workers in this area are valuable for additional information. Since this is a fairly new field, having been recognized only recently, many teachers do not yet understand or accept the ideas that it presents. Some college professors who are trainers of teachers have been reluctant to accept the concept.

A plea is being made for teacher education departments, teachers, and parents to examine the ideas of this program in relation to their effect on the child. Until this is done, many children will continue to lack proper teaching and will continue to fail to learn to read.

Perception is learned. If a child has not learned perception when he enters school, he can be taught; if he is not taught or trained in perception, he may never learn it to the fullest extent. If a child is clever, he may learn to compensate for his lack of perceptual training, or for much of it, but the time spent in learning to compensate retards him from developing to his full potential; he is gradually getting behind in what he should be doing and will likely encounter frustrations and emotional and psychological problems. Often this type of child becomes a school dropout.

In Eugene, the effects of the Perceptual Development Program have been seen: happy children with a good self-image, eager to attack new problems, successful in their work, and moderately successful in their reading ability.

In September 1968, 417 beginning first graders were tested. Of these, 150, or 36 percent, failed five or more of the subtests and were considered potential reading failures. The experimental group consisted of 45 children who were placed in three first grade classrooms; 89 children were selected for the control group. The control children were identified on the test but were not identified to the teachers. The percentage of children failing five or more subtests ranged from 18 percent in one school to 52 percent in another school. As stated previously, very little correlation was found between failure on this test and intelligence. There was a correlation between failure on this test and socioeconomic conditions. The schools in the lower socioeconomic areas had the higher rates of failure. This fact is consistent year after year. During the past three weeks, testing has been completed on all the beginning first graders in 12 elementary schools.

In June 1970, at the end of the second grade, the *Gates-MacGinitie Reading Test* was given to each child. Of the initial 45 experimental children and the 89 control children, there were 22 experimental children and 32 control children remaining in the original schools at the end of the second grade; the rest of them moved away from the original school. At the end of the second grade, the testing results showed that 19 of the 22 children, or 86 percent of the experimental group, scored above the 16th percentile of their school norms. There were 3 children in the experimental group and 22 children in the control group who scored below the 16th percentile on the test.

The 86 percent success of the experimental group, as opposed to the 31 percent success of the control group, was a remarkable gain. Follow-up on these children is planned through the third and fourth grades to ascertain progress. If a child is successful at the end of the fourth grade, he will make it. The success rate during the next two years will yield much more information. In June 1971, another group will be completing the second grade, and in June 1972, a much larger group will be completing the second grade. By that time, there should be sufficient data to begin formulating definite conclusions and recommendations.

PANEL PRESENTATION REACTIONS AND COMMENTS CONCERNING ACTION PROGRAMS

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DR. MURIEL SLOAN

It may seem superfluous to have a panel of individuals react to the three action programs we have all seen so well presented. I am sure each one of us in this room has developed a complete set of reactions based upon his or her reception, integration, and interpretation of the auditory, visual, and kinesthetic stimuli provided by these programs.

Essentially, the purpose of this panel is to implement what has been the primary focus of the Perceptual-Motor Task Force since its inception, that is, multidisciplinary cooperation and communication in the area of "human becoming." The action programs were selected, not necessarily as representing the best programs in existence, but primarily to show a representation of the different kinds of programs that exist.

Each panelist was asked to react to the programs from his particular viewpoint. Each panelist will take a few minutes for initial reaction so that you and the other panelists may listen to them. Then the discussion will be open to the panelists to see whether we can get an interdisciplinary interaction going among them. We will also give each panelist a chance to add to his introductory remarks. After that, we have approximately a half hour for interaction among the audience, the panel, and the action program speakers.

DR. MILTON AKERS

Each time I participate in a session of this kind, I'm struck by one thing—we know so much about human development and how to work with it; we're learning so much. Yet, it looks and sounds about the same as it did when I entered the field about 20 years ago. Twenty years ago when I began working with three- and four-year-old children in nursery schools we had balance beams. They weren't always the commercial products we have today, in other words nice and clean; they may have been railroad ties, planks, or logs. We had hoops, balls of all sizes, balloons, and worn-out retreads, which were the forerunners of the trampoline. I think that they were there because of someone's very good intuition. I think the difference is that we're learning why they are there and how we work with them.

New knowledge is giving substance to our intuitions. A great deal of teaching is intuitive and a great bank of resources are in demand. The intuitive quality is still important. Those of us who work with teachers should help steer our new knowledge and new insights in the direction of better intuitions on the part of teachers. At the same time, I'm struck with the fact that we know a lot. I'm even more struck with the fact that we know so little. Rather there's so much we don't know. I guess learning and discovering is a great deal the same for adults as it is for children. Asking something and succeeding is a pretty heady task.

I wonder if we're not slightly carried away by some of the things we accomplish. It is true, I think, that in our study of child development we have identified certain skills and accomplishment levels that fit into the pattern of the effective, functioning child. I'm not at all certain, however, that we're able to put them in an absolute sequence. We don't know what happens within the organism as the child takes that experience and makes it an integrated part of himself. The contributions of biologists and neurologists are sharpening our insight in this direction. But I doubt that we're as far as we think we are in the direction of neatly determining the steps and processes of human development. In fact, I'm not at all sure, that I want us to do so. If we ever know what the sequential steps are and can control them, human beings will become terribly dull, as well as run the risk of being manipulated. I think it's somewhat dangerous to talk at this point about training psychological functions any more than we can train cognitive or physiological functions. I want to remove it from the field of physical education and place it in cognitive development.

I recently visited a well-known program which is soundly based on Piagetian principles. Piaget identified certain sequential steps a child must go through in organizing his intelligence. I watched a teacher putting children through certain mechanical kinds of paces, and the teacher got the desired response. The teacher assumed that having gone through those mechanical paces, something had happened within the organism–growth and development had been enhanced. I'm not at all sure about that.

Often, we learn more about what happens to the administrative organism than the recipient organisms. Because the administrative organism succeeds in getting the response it wants, I don't think we know yet what goes on within the organism itself. Morgan spoke yesterday afternoon about trying to get out of our rut of formalized, frigid thinking. I fear that we're going to jump right out of one formalized thinking into another. I wish we would talk in terms of what we know or believe as of October 2, 1970. I wonder what we will think on October 12, 1970 or October 2, 1971.

I've waited in vain for one of the presenters to describe some of the failures, frustrations, or problems they encountered in their programs. Unfortunately, the federal government has a minimal tolerance for failure, so that when one goes to Washington, one does not describe failure. But we're in the family here. Part of our learning might have been enhanced had we heard some of the failures and frustrations that the three people encountered. I doubt that any one of the presenters feels that he has found the absolute solution. We will learn a lot more from research and action programs if we hear both sides. Research and action programs do not prescribe; they simply suggest ideas for us to use in our work with children.

DR. HALLY B. W. POINDEXTER

First, a word of commendation. It takes a great deal of courage to present an action program for five persons to react to. Reaction implies some sort of criticism and usually of a negative kind, so I would like to say these people are relatively courageous.

I'm terribly concerned that we are saying cause-effect. Things cause and there are effects but I think we are not at that stage right now. I think we should encourage analyzing and finding out exactly what does happen neurologically, physically, and emotionally to the child as he learns. We have the ability to cope with this and I don't feel it will become an impersonal matter. I think we will always personalize education. But until such time as we can honestly say thus and so causes, and thus is the result, we run the risk of defeating ourselves and certain goals we're trying to attain.

I'd like to give a quick example from one of the demonstrations today. A statement was made about how exercise is very helpful in calming the hyperkenetic child. In a rather extensive program we have gone through in the past few years we have found quite the contrary. We had to change our program considerably because we did nothing but irritate the already hyperkenetic child.

In my view, a perceptual-motor development program is simply a very good developmental physical education program. For someone concerned with other aspects, it is a little bit more encompassing than that. I think we have tried to make this issue more grandiose than necessary. Could it be possible that a child whom we help to acquire movement patterns and developmental tracks in movement is freed from this concern? He can then leave the concern of psychomotor development and be free to operate in the cognitive and affective domain. I'm sure you've worked with children who could not walk from here to the door without caroming off tables and chairs. Once this child masters himself and the image of himself, he doesn't have to worry about that any more. He can busy himself with different kinds of learning.

I'd like to pick up the issue of transfer. Whenever you work with children in a laboratory or classroom, you will say, "see, watch this," "here, now let me do it again", or "listen to this." Often, in teaching movement, we say, "do." We use the word *training* and a response-command formula very much like zoo trainers use with animals. We don't ask them to feel. Could we be more meaningful if we said, "let's explore this movement" and "what does it feel like to be low?–to be in a ball?" Perhaps somehow we could put cognition and affection with the kinds of movements that are explored.

DR. JAMES CAVANAUGH

As a physician interested in learning problems in children, and knowledgeable about some of these problems, I've been asked to comment on the three papers presented today. I had the opportunity to read these papers prior to hearing them and thus have arrived at some of my comments after going over them fairly carefully. The comments are made in a constructive way, and they address three fundamental issues which arise in all three presentations.

Optimal development of potential seems to be fundamental in any kind of educational process. We are concerned with motor learning as it applies to language learning, which is the most uniquely human of the capabilities that a child has. The closer the educator, physician, and psychologist move toward understanding the child as he learns, the closer or the greater the overlap in their own roles and in their information.

First, I'm concerned about the assumption of postulates as dogma upon which systems are built in the absence of proof. I think a considerable amount of this occurs not only in motor development research but also in research associated with child development. Is there any indication that motor development influences children's cognitive growth? Although we're here as a step toward resolution of this kind of query, there is no such proof. Is it evident that gross motor development is necessary for fine motor coordination? Is it, in fact, necessary that "near point vision" have anything to do with fine motor coordination, and is it necessary to learning?

Clearly, visual perceptual skills are necessary to the child as he begins formalized education. Some children evidence the development of these skills in the absence of other motor skills.

Secondly, I'm concerned about a jargon without meaning. The psychologist has attempted to "neurologize" the psychological aspects of learning. In this attempt, he has tried to superimpose an anatomical model upon psychological behavior. The educator must apply meanings to his terms if they are to be added to his lexicon, and he must apply the same scrutiny to allied fields and workers within those fields as he would apply to himself and his coworkers. Obviously, this is difficult to do, and it requires the cooperation and participation of people in allied fields. A dispute demands a definition of terms. The measurement of a child's hearing has little to do with perception, but has much to do with sensation. Visual tracking has little to do with reading since sikatic movements with fixations are involved in that process.

An intelligence test with middle-class white norms from two decades past may have little relevance to a sample under study. The same reading test grade level can mean that a child deals with primitive material skillfully or more advanced material poorly. The quality of research depends upon the knowledge of the child and the knowledge of the tools and tests which assess the child.

Finally, the quality of research concerns me. To be done well, to influence the kind of answers we expect, we must know our fields well. Do we know, for example, what is normal for a child of a given age from various subcultures?

The effectiveness of a team approach is directly proportional to the quality of each of us as we bring our capabilities to bear on complex problems. Continuing dialogue is critical between the researchers and the users, both within and without these various disciplines.

DR. DARREL BOYD HARMON

I'd like to start out by congratulating those who planned the program and the effectiveness they have had in illustrating that there are many approaches to perceptual-motor development. I think they should be complimented, regardless of what some of us might criticize in the experimental design, what was presented, statistical methods, and the like. It's a willingness of all of those concerned with education to step in and learn more about how children learn to develop.

I'd like to comment on the failure or success of results in perceptual-motor training. I am convinced from my own research that success or failure rests in the relevance of the motor area that is trained in relation to the perceptual skills that they take or have been tested. I think we have been too general in testing certain perceptual skills and saying this method or that method either works or doesn't work.

I've been impressed with the use of the broad term *perception* to define the concern of this particular group. It can mean many things to many investigators. In fact, I was told at one time that every psychologist had his own particular definition of perception, and that I would not be able to find a universal definition reasonable to my own work. So I had to set my own, and about as far as I could go in my own definition was, "meaningful awareness of the world around us in the view of a child, as that meaningful awareness could be utilized in directing his subsequent behaviors in problem solving or in living."

I think any use of the term perception is too broad for the specific interests of this group. I think probably Dr. Frostig hit on the old term that some perceptual investigators have rejected and that the physical educator ought to pick up and rehabilitate–*sensory-motor training.*

Now that we have research of this kind reported here and evidence that effective motor functions have some effect on enhancing perception, I think it is time to develop a rationale for the function of the physical educator on the interdisciplinary team that is concerned with developing the child.

Dr. Frostig gave us a good overview of all the factors we have to take into account in the developmental program, even though we may or may not agree with some of her methodology. She pointed out that the teacher was the center of developmental activities. The other disciplines in a multidisciplinary approach are advisors to the teacher in further understanding the child and providing an adequate program for the child. Because the physical educator is a teacher, we should begin taking a look at what the physical educator should do in light of the knowledge we are uncovering. A great deal of emphasis has been put on movement and movement learning. Maybe in that would rest some of the statement of a rationale for the physical educator.

In answering the question "motor skills for what?" I think it is insufficient to say motor skills for perception, because I don't think we can produce all of the transfer of training necessary to move from one motor experience to another through skills directed at perception. We should examine a lot of research that has taken place in the past and update it in our thinking to see if we can find the function of a physical educator.

In the biologic symposia of 1935, Lashley presented a paper in which he demonstrated that all learning was direction of movement. Then there are other areas that might be concerned with biokenetic functions, such as Warren McCullick with his concern with derivation of universals of perceiving and research that neurophysiologists are presenting which shows that localization or identification with something in our space world is different from orientation in that world.

If we take a look back at Lowman's demonstration in 1918 and Grosfeld's statement that visual space is an optic extension of gravitational functions, we can lead up to the fact that the emphasis on motor training is not for perceptual development but to lay the foundation for the gaining of skills in experiencing. This relates to a statement I made to this organization in 1940 when I said that it's the function of the classroom teacher to educate the child and it's the function of the physical educator to keep the child educable.

DR. LEE HASLINGER

I'm reacting from the viewpoint of a man who day by day has to decide physical education curriculum for 14,000 school children. I must assimilate information about programs, objectives, methods, and materials and make the thing work, get interaction between teacher and pupil. That's where the action is and I know many of you face this same problem. You are doers, you're on the home front, you've got to make this work. When you go back, what are you going to do? How do you decide what to do?

I think we received some assistance today which may help us do things a little differently and a little better. I submit though that we wouldn't be here today if it hadn't been for the early doers who stumbled along and gambled on methods and started to look at children a little differently. They welcomed action and interaction and criticism.

I am concerned when we ask how do we know that what we're doing is working? How do classroom teachers know that they are causing the change? How do you know what the balance beam does or the hoola hoop? Often we don't know. But teachers who deal daily with children know that they change because of their interaction with persons and things in the school environment. Teachers can't always put their finger on what made the change: Did this cause it? Did that cause it? Was it an accumulation of activities? Many of them don't really care. They want to know if the child is changing and growing in terms of an educational framework or conceptual model that the teacher has in mind.

I think Ray Barsch said a few years ago that it's no longer a question of whether special programs in perceptual-motor development belong in school programs. The large programs that are already there attest to the fact that they're here to stay. The real questions to be answered are the kind and amount of such emphasis. I think the doers today are giving us help. We have many unanswered questions. Barsch spells them out very clearly. We need to know more about the intensity, sequence, emphasis, amount, and kind of perceptual-motor development.

I think we have to get straight in our minds what is physical education. Terminology is confusing. Is movement education an extension of physical education? Is it concerned with sensory input and motor responses, using a variety of sensory modalities? Is physical fitness physical education?

I think we have to know whether or not we have tools that we can grasp and use. Perceptual-motor activities, physical fitness activities, and movement education activities are tools we can grasp. The teacher can use them with reference to objectives he seeks to develop in a quality physical education program.

DR. POINDEXTER

I direct this to Dr. Haslinger. Perhaps teachers don't know why things happen or don't care when they find out, but if you know why, the economy in time, effort, and money is untold. You may find that if you knew why things happen in education and could say, yes, in fact, this does happen, when this does happen, perhaps you wouldn't have the problems of remediation. You would all be prevention men. We often thank ourselves for something we didn't do. You've heard of normal everyday development that occurs outside the school. This is a factor we haven't learned to cope with. We must learn to estimate and evaluate the development of the normal child.

DR. HASLINGER

I didn't mean to imply that we should be unaware of what is happening, but we don't have to dissect the child daily in the classroom. We just can't do this. You make decisions based on the best information available. Cratty said, "Do it today and believe in it and be ready to change tomorrow." I think that's where we are. You've got to go to school and teach children. What are you going to do? How are you going to do it? You decide on something and you study it. Then the teacher depends upon observable behavior and behavioral changes to decide if her decisions were accurate. It is a constant evaluation-decision process on the part of the teacher. Probably far too many teachers don't go through this daily process. They do what they've done forever. I suggest it's time to change.

DR. CAVANAUGH

I'd like to pose a query to the educators of teachers on the panel. When and how are you going to deal with the problem of moving out into the classroom to teach or help the teachers deal with observation and ask the proper questions? Teachers don't know or have never been taught how to observe the child properly. They don't know the questions to ask. When are the schools of education going to render this service?

DR. SLOAN

I have seen a great deal of progress being made in this skill of observation that you're talking about. I think I've heard several times in this conference the plea for the development of observation skills of the process of movement in addition to attending to the products of movement in the sense of the outcome. So it's not only the scores or the outcomes, but observing the child as he reaches a particular score. This is where movement educators and physical educators can help to diagnose problems that may exist and affect the child outside of the gymnasium.

I agree that this is a very important objective of professional preparation and that, in many cases, we do not do enough of this. We need to do more but I think that plea, that need, has been registered on us at this conference and much before this in many cases.

DR. POINDEXTER

Dr. Frostig, you showed us a profile of a youngster. After you work up this profile and find the disabilities, will you explain how you program for this child? Also, would this be economically appropriate for a public school?

DR. FROSTIG

I think if I explain how we do it, you will see that it can be done in public schools. First we use a test to train teachers so they can learn to read test results, see the test protocol, and know the areas of development we are exploring.

Teachers fortunate enough to be in school districts in which tests are available will work with tests. Many of them will not; they will not be lucky enough always to have a psychologist at hand. Therefore, we show the teacher how to observe classroom behavior and how to set up situations in which she can observe the areas we are testing. Then we give the teacher a table. In the first column of the table there are symptoms and the teacher records the symptom she observes—for example, a reversal.

At this point, we check with the teacher to see if this is a reversal because the child does not differentiate between the direction of a stationary object. The teacher then tests the child with one of our tests or any other one, drawing something on a piece of paper to see if this child does not discriminate. If the child does not discriminate, the teacher then goes to the second column; which indicates tests and observation in the classroom. The teacher learns from this column that when she sees a reversal, she must use certain materials to find out what the reversal means.

The third column indicates underlying deficit. In the case of reversal, this might be discrimination of position in space. The fourth column tells the teacher what materials and method she can use to help this child.

But when you see the word "reversal," there may be also another difficulty. We may be finding that this child has no difficulties whatsoever with the perception of position in space; what he has is an associational difficulty. He doesn't know which is the "b" and which is the "d."

If the teacher finds that the child has no difficulty with the discrimination of the direction of position space, she can conclude that this is most probably associational difficulty. She would, of course, have to exclude visual perception difficulty. Then we are concerned with the treatment of the underlying symptom of associational difficulty.

The words *educational procedure* may be better than the word *treatment.* We use many techniques to help the child. There are many technical devices, such as the one Katherine Stern devised.

We have the teacher observe the symptom, use the testing or observational methods which help her see the underlying symptom, pinpoint what the underlying difficulties are, and, of course, find treatment. As we work with teachers we try to help them so that they don't have to invent everything to find the methods which will help them.

DR. SLOAN

Question: Do you think we might lose something in public school action physical education programs if we substitute, for those, programs designed to correct learning disabilities and problems?

Dr. Frostig: I personally do not feel that I use a program which is remedial or advocated for the school child with difficulties. I think that all children with difficulties in movement need emphasis on certain areas.

Dr. Haslinger: I want to know if there is a chance that programs for children with learning disability or certain inefficient movement characteristics would be substituted with regular physical education.

Dr. Frostig: I know that we are interested in solving any questions about learning disabilities. But if I am a child in a schoolroom and I don't have a learning disability, I hope my teacher is giving me an active program and is not trying to analyze me at this point. I want to have fun and not be a subject of analysis.

Dr. Haslinger: I think that is a good point. There may be a misunderstanding that programs for physical motor development are designed to alleviate some deficiencies. I look at them as developmental for all youngsters. The quality of our physical education improves because of what teachers learn by watching the child in action. You can have perceptual development motor programs and they don't have to focus only on individual moves when you identify inefficient movement. So far, we have designed programs to maximize the opportunity of the skilled mover and not the unskilled or inefficient mover. We must overcome this.

Dr. Cavanaugh: The overwhelming bulk of children who have a learning disability do not have a perceptual-motor handicap. This seems to be forgotten. One has lined up perceptual-motor handicap with learning disability. Most children who have a learning disability are socially and culturally deprived. It seems that if one had the priorities for time usage within the hours of a traditional classroom setting, for some children it would be advantageous to address their cultural deprivation rather than to address something reasonably sophisticated. Now, there are other children who have perceptual-motor handicaps. Without some kind of training or dedication which will address that handicap, they will not be able to move on to the initial steps of language learning or those things that concern the kindergarten or first grade teachers.

There are many kindergartens that are involved with things which most of the children in the class are going to do spontaneously. One need not train a child to develop visual perception. He will develop it, although you can enhance it. But there may be priorities that ought to be addressed as we go about early childhood learning.

Dr. Akers: I think it is a very important question. I am referring to the Head Start experience here last night. Here's a program where we've picked up children with deficits and have been trying to work with them in a remedial program. We are trying to work with parents in terms of prevention in these areas. We in education ought to take what we are learning in dealing with children with definite problems and begin to find them at an early age. This does not mean that we are not going to have to keep concerning ourselves with children with problems at all times. I think it's time we make that switch to one of prevention rather than constantly lagging behind in remedial programs.

Dr. Sloan: I think that the question that has been raised is the one that physical education raises, that is, where does physical education, as each one of us defines it, fit into this other area, which still lacks definition, even as of the 1968 symposium. Where does it fit into that which we call perceptual-motor development, perceptual-motor learning, or whatever term you might use? Some people say that physical education is perceptual-motor learning; implying that there is basic functioning or functioning to basic use of motor skills, perceptual skills, and so forth. Others say that if perceptual-motor learning deals with the disfunctioning, then physical education has only a small role to play.

Dr. Frostig earlier made a distinction between physical education and movement education. She referred to her programs of sensory motor functioning working on central motor skills as a program of movement education. She stated that movement education has as its explicit purpose the working with sensory motor functioning of the child. Physical education also has this objective implicitly within it, but, in addition, it often has many other objectives. It seemed to me that the movement education she discussed provides a good basis for any physical education program. Then physical education went beyond it, its own basic objectives.

Question: Which of these two concerns do you direct yourself to the most? Do you concern yourself with what perceptional concerns can do for movement proficiency or what movement concerns can do for perceptual efficiency?

Dr. Sloan: I think you are talking about the hyphen between perceptual and motor. At a recent symposium, I suggested that the hyphen could be interpreted as a double-ended arrow. One difference between physical educators and those who primarily work with the disfunctioning or with other areas in language skills is the direction in which that arrow is placed. We know that all of these skills probably are based upon an interdependency of perception of functioning. I am concerned with perception as it relates primarily to the development of motor skills. Although I am not unconcerned with movement and its relationship to the development of perceptual skills, which might then lead to language, my primary focus is with the arrow going toward the motor skills. I cannot, however, escape the interdependency nor my potential contribution to any other skills that are important to human becoming.

Question: Do you use computers in your program?

Dr. Cavanaugh: Yes, we use them in terms of gathering statistical data on large numbers of children in pre- and posttesting. It is a lot easier than trying to hand score tests and go through a lot of data. Only because it is expedient to handle them this way do we do it in that manner.

Comment from Audience: I do not agree with Dr. Cavanaugh's statement that children who show the highest incidence of learning difficulties are not the ones who have the perceptual problems. I find that the cultural deprivation he mentioned is quite evident, but the children with cultural deprivation also have the highest perceptual deficits. I think there is a correlation between learning difficulties and perceptual problems.

Dr. Cavanaugh: I would agree with you that there is a correlation between perceptual problems and learning difficulties. I would also agree if you are equating or positively correlating the severity of learning problems with difficulties of perception. Most of the children in our culture who either are perceptually handicapped or have learning disabilities have problems arising from social and cultural deprivation. There are many other causes for difficulties in the neurologically handicapped. If you are handicapped or damaged prior to the full development of the brain you will have perceptual problems. The child who inherits the disability of language learning also has perceptual problems.

These two categories represent a fair percentage, probably 15 percent, of the children in our school systems. Studies of deprived youngsters, of the inner-city child, show that one can alter, or does see some alteration, in their visual perception against the visual perception of advantaged youths. I suggest that this is more a problem of performance than of competency, which is not the case in the child who had a perceptual handicap. We in medicine see the child who has neurological damage or neurological disfunctions.

Dr. Frostig: You are right. There is a different etiology resulting in a different kind of visual perceptive disturbance. Fortunately, from research which we have not yet published, these children improve very quickly with visual perception training. It is important to realize that you cannot make a dichotomy between the perceptual training and language training in the sense of the child's understanding. You have to give the child experiences. You have to have something to talk about before you can develop language. The child who is very deprived can be improved just by grammatical and vocabulary training that involves him in personal experiences and the relation of these experiences to language. What we are trying to develop are methods which would help these children develop totally, not just in certain skills. We are working in Compton, an atypical district which has 7 times the crime wave of Washington, D.C. We work there with children using a kind of visual perception language training which I feel should be done with the total child. The gain on cognitive tests of the culturally deprived group was from the 35th percentile to the 95th percentile. This corresponds with the 65th percentile of responses of middle class children. If you give these children experiences which help them understand the world around them better, they will also have to talk and think better.

Dr. Akers: An important consideration in the development of language learning in a child is the development of his auditory system. The child normally brings to a traditional or formalized education certain intuitions about his language which have been arrived at through auditory language experiences during the beginning years. It is, therefore, not appropriate for the youngster who has difficulties in this area to focus on visual-perceptual training. It is far more important and critical in his development to present him auditory language training which, in fact, may be deficient.

Question: Do physical educators accept perceptual-motor as a highly structured developmental, sequential program, or only as incidentals as, for instance, fun and games?

Dr. Poindexter: I think it would be a tragedy for any of us to admit that we do not see it as a developmental program. I think we have a vocabulary of movement and have built our vocabulary into a paragraph, perhaps a play or a scenario. Although this developmental program is very well defined, the intuitive and creative teacher does not stay within its structure. Children don't develop according to a calendar, and teachers can't respond according to a developmental calendar. As the child requires, the teacher must respond. I would say that most of the physical educators whom I have spoken and worked with look upon this as an ordered plan, but not so ordered that it is structured and limited–it is fun.

Question: I responded to a short article in the *Milwaukee Journal* which went something like this, "Fifty percent of the children in American schools are functioning in an environment one or two years ahead of their best learning potential." When I got the answer back they said it was more like 75 percent now. We seem to be doing things earlier and earlier. Are we trying to get something done too soon–before the child is ready?

Dr. Cavanaugh: Perhaps the answer to that is, are we trying to get the child into a curriculum or a curriculum into a child? I think we must consider the child's skills and abilities. Is he ready to learn what we are going to teach him in the curriculum that was devised in a rather lop-step method, or are we going to meet the basic needs of the child first? Can we prepare him through good concrete experiences and give him the tools to best learn the task?

Another thing happening to us today concerns middle class society and the experiences which children are allowed to have. They're not allowed to play on the lawn or streets, and the playground is frequently some distance away. I would like to know where children play? Where do they get the experiences to develop some of the things we have talked about today? The etiology is not always biological or inherited; it is often environmental.

Dr. Akers: I think that is a very important question and one a lot of us are getting anxious about. I think it was a shock to have discovered that a three-year-old child can read. How many of you have seen a three-year-old child read? They read with obvious handicaps. What we don't know are the concomitant side effects. The problem is that we are dealing with an American culture that wants everything to happen in a hurry. Just what we do with this knowledge intrigues me. When Piaget was in this country a few years ago, he was asked, "If we know the way children develop in their intelligence, how can we make it happen faster?" He laughed and replied, "That's the American question: How can you make everything happen faster?" My only suggestion would be a word of caution. Although we can make children go through the paces earlier, we don't know the resulting side effects or the long range effects.

PART III

A QUEST
FOR UNDERSTANDING

. . . . we perceive perceptual-motor development to be one of the most critical processes in human development, if not the most critical.

MARGUERITE CLIFTON
Cincinnati, 1970

THE IMPLICATIONS OF PERCEPTUAL-MOTOR PROGRAMS FOR PHYSICAL EDUCATION

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Even highly competent professionals need to steel themselves against simplistic "all-you-need-to-do-is" solutions to complex problems. Each promising new practice emerges with the siren song of "this will solve the problem."

Currently, hopeful educational eyes are focused on perceptual-motor programs. Responses vary from enthusiastic acceptance to complete rejection. Scientific research indicates that a promising area for investigation has been identified, but final conclusions would be premature at this point (1). Perceptual-motor programs are not a cure-all, but they are an important facet of a multifaceted scientific approach in education.

Recent knowledge in perceptual motor functioning has contributed importantly to educational programs. No longer can we automatically attribute learning failures to recalcitrance or lack of potential. Unfortunately, we have created an unintended dumping basket in which to place poor performers, and now have high sounding scientific labels to excuse our failures or to make learning so mysterious that a teacher may accept defeat without even trying. A question more important than "Does he have perceptual-motor difficulty?" is "What are we going to do about it?"

Often with a new idea, ritualized, nonscientific programs emerge with groups of disciples and the Hawthorne effect gives credence to their endeavors. Such programs, regardless of their validity, have the built-in advantage of being different and can therefore elicit from the learner more effort than the familiar and often boring program to which the learner has become habituated.

Movement programs and perceptual-motor training are not the panacea for educational or emotional difficulties. In fact, there is an alarming lack of scientific substantiation for much of what is claimed (1).

Movement is only one component of the learner's total development, it is not the basis from which the totality of social, intellectual, emotional, and perceptual attributes stem (3). Motor activities may help some students, but they are not a cure-all for perceptual deficits. Nevertheless, knowledge based on programs that are intelligently implemented can make an important contribution to the intellectual, social, and emotional growth of a learner. Our new focus on and alertness to perceptual-motor dimensions afford new insights into the learning process, and movement experiences which improve the perceptual-motor capacities should play an increasingly important role in education.

In our zeal, generated by new knowledge from the perceptual-motor field, we must remember that a good physical education program should exist in its own right because it makes important contributions to the learner which are not solely academic. Physical education is one of the few areas where we can confidently assume that the learner's needs will not markedly change by the time he reaches adulthood. We are told that motion pictures will replace reading as the most important medium of communication and information, that libraries as we know them will become obsolete, that paper and pencil computation already is archaic, but to date no one is assuming a major change in the design and functioning of the human body. Consequently, facility, efficiency, and expertness in the use of one's body is predictably useful throughout the learner's life.

It will continue to be important for the information received through the learner's senses to be accurate and efficiently acquired. It is becoming increasingly critical for the learner to develop the ability to selectively and consciously "tune in" or "tune out" each sensory channel as well as "turn off" stimulation for necessary relaxation. Recent exploration indicates that increasing control of one's "switchboard" is a learned response that yields tremendous dividends in all learning and offers social and emotional comfort.

Another reason for the existence of a physical education program in its own right, and not merely as the handmaiden of academic learning, is that our body, with its movement potential, is our most visible asset. Physical education produces effective ways of increasing skills in body management, including the draining of tension. It is possible to conceal deficits in math or reading. It is virtually impossible in human encounters to conceal body or movement problems. Each of us draws immediate inferences from a person's body, posture, and movement, by how he looks and what he does rather than what he is. With this physical visibility goes social and emotional vulnerability. As a result, we find a high correlation between movement skills and feelings of worth and social acceptance.

A third reason for the importance of an effective physical education program is that it provides a responsive setting so that a learner can become in "charge of himself." He has irrefutable evidence that he can start himself or stop himself. It is possible for motor activities to help a hyperactive child control himself better or a phlegmatic one to activate himself. It becomes obvious when the learner can "attend" and respond appropriately and effectively. (Did he catch the ball or stay within the markers?) Most importantly, he must do it himself. Others can assist, but no one can do it for him. As a result, he has the opportunity to develop increasing mastery of self through slow movements and coordinated motor control. Based on these skills of starting, stopping, attending, controlling, and deliberate isolation of senses, true freedom, choice, and creativity become possible.

Finally, a good physical education program enables learning which has high transfer potential to expedite future learning. Such transfer can be desirable or undesirable. Attitudes generated by physical education, "If I work at it, I'll succeed" or "It's no use trying" have equal transfer potential. A "failure set" can result from confrontation with unachievable tasks and the learner may not even attempt feats he could readily achieve. Desirable transfer must be taught, for it does not occur automatically or as a result of faith, hope, or wishful thinking.

Only recently have the factors which result in appropriate transfer been made explicit for teachers (5). A program based on these factors and designed to help children better control their own activity and behavior should yield progressively longer self-control, longer attention span, and more productive orientation to any learning task. Self-control is not how you really feel but what you do about it. Achieving motor control is an important step in self-direction.

Consider what current research in movement, perceptual-motor skills, and human learning tells the physical educator.

The Teacher

Probably the most critical factor in learning is the teacher's ability to promote it. Teaching competence encompasses knowledge based on research in movement (rather than on folklore or tradition), plus the ability to incorporate knowledge (also based on research) of human learning in the teacher's behavior. Such incorporation involves decisions made about factors which will most effectively result in increased student motivation, accelerated rate and degree of learning as well as retention of learning (4), and most importantly, provision for the appropriate transfer of that learning to new situations (1).

Diagnosis

Equipment and descriptive tasks alone will not insure that objectives are appropriate or that they will be achieved in perceptual-motor learning. Accurate diagnosis of each learner must be made so neither experiential gaps nor useless and redundant experiences occur (2). Diagnosis need not be a time-consuming, elaborate procedure but should consist of teaching episodes which yield valid information on learning behavior; this is more effective than the pass-fail method of determining a student's status. "What should he do to learn it?" is the critical diagnostic question. Inability to perform may indicate that the student needs more experience or specialized instruction to close the gap.

Early diagnosis that will identify future learning difficulties is more important than blanket methodologies or equal dosages of perceptual-motor training for all. For some poverty children who have had frequent and varied play experience, increased time devoted to language skills may be indicated. For some overprotected middle class children, movement experiences may be essential. One cannot generalize from any group to an individual child, however—each learner must be assessed.

The emphasis should be on diagnosis and preventive programs which focus on development rather than remediation, for movement patterns that are developed tend to remain and errors stubbornly resist eradication. Skills that are mastered (i.e., skating, bicycling, dancing) are amazingly durable even after years of no practice. Because of this, we should aim for flexibility with sensitivity to modification and adjustment so that no one skill becomes too firmly set in a certain pattern. A modification program is most effective when the attribute is in a formative stage, and with much perceptual-motor development, this occurs before age seven.

Prescription

Diagnosis is meaningless unless it generates a practical prescription capable of being implemented in the schools. Too often diagnostic data explain failure rather than generate success. We would not think of permitting a learner to drop out of reading because it was "difficult" for him, but physical "sideliners" exist in abundance. We must predict and remediate before frustration and failure are reflected in classroom performance because they can trigger exclusion and rejection from peers.

Because prescriptions are custom tailored, rather than a patent medicine for all, specific objectives and groupings must replace the total class instructional periods. The prescription must take into account the appropriate task, the appropriate group in which to achieve it, and the consciously determined behavior of the teacher who will facilitate that achievement.

Evaluation

The incremental nature of perceptual-motor as well as cognitive learning necessitates constant monitoring of achievement to determine whether to proceed to a more difficult task or to offer additional opportunities for mastering the task. Perceptual-motor training has the built-in advantage of being judged in behavioral terms; therefore, the teacher is not as tempted to move ahead in spite of incomplete learning. It is easy to overlook the fact that a student does not understand chapter one and moves on to chapter two. It is impossible to overlook the fact that a child cannot perform a simple perceptual-motor task and therefore should not move on to a more complex one with built-in failure.

This high visibility of success or failure in perceptual-motor tasks may explain some of its assets. The built-in behavioral aspects of such a program help us avoid many educational "sins" which result in learning failures in other areas. Significantly, all objectives are described in behavioral terms–something we need to accomplish in academic areas. As a result, it is obvious to teacher and learner what the objective is and whether or not it is being accomplished. This perceivability prevents teachers from moving on in the face of unsuccessful learning and gives a student immediate and concrete information on his degree of success. One youngster remarked, "I like skating better than reading because you know when you can do it. Now I know I can skate, but every time I think I've learned to read, the teacher gives me a harder book and I have to learn to do it all over again." Growth in prolonging activities, impulse control, and other improvements in task proficiency are easy to observe and assess.

Immediate and concrete knowledge of results encourages and motivates a student to focus and direct his learning. It also enables a teacher to become aware of when and where something is amiss so assistance may be immediate rather than "too little too late." Here again, the teacher's conscious incorporation of the principles of learning in whatever "assist" is given the learner usually makes the difference between accomplishment and failure.

Significant evidence is available to demonstrate that some programs in motor education have improved a child's self-concept to the extent that he has gained confidence in his ability to succeed. However, direct transfer to academic learning will predictably occur only if the factors which promote that transfer are systematically incorporated in the perceptual-motor program. These factors promoting transfer have remained undefined until recently. Only within the last few months have they been sufficiently described so a teacher can incorporate them in a perceptual-motor program. These factors are discussed in depth elsewhere (5). Here they will merely be identified and a few, out of many possible examples, will be given. Remember that transfer may be desirable or undesirable, so a teacher will sometimes use these factors to promote transfer, and at other times use them to prevent it.

A factor promoting transfer is the perceived similarity of the situation in which something is learned and the situation to which that learning will transfer. The more similar the situations, the more likelihood that the learning from one will "spill over" into the other. The teacher is an important factor in this perception of similarity. ("Remember how you stepped out with one foot when you threw the ball. When you kick, it's as if that foot is throwing the ball, so what will you do with your other foot?") Similarity can result from the elements in the environment (ball, court), from what the learner does (step, throw, kick), or from how the learner feels ("Climbing the rope is like learning to read. At first it looks so hard you don't want to try. When you learn how, it's fun to do.") Verbalizing that similarity will help a learner identify it, thereby increasing transfer. Identifying and verbalizing differences helps prevent undesirable transfer. ("When you are going to run a long time, it is not like running a race.")

A second factor promoting transfer is the association of two learning situations for any reason. Emotions are particularly susceptible to such association. Successful perceptual-motor programs associate effort with achievement. Hopefully, this pairing will transfer so when the learner desires to achieve more learning he will exert effort. Conversely, effort which results in failure will be associated and transferred, resulting in future reluctance to attempt learning. Because feelings easily associate and transfer, special teaching effort must be expended to see that the transference is productive.

A third factor which influences transfer is the degree of original learning. Skills poorly or inadequately learned transfer inappropriately, if at all. Therefore, a teacher should be aware of the "once over lightly to cover it" teaching method and make sure that one skill is reasonably well achieved before moving on to a more complex one. Perceptual-motor programs have the advantage that successful achievement is highly visible; therefore, premature advancement is not as likely.

The most important transfer factor for the teacher to consider is the identification and labeling of the elements which make a situation what it is. Identification of critical, unvarying elements is not more powerful than the other factors promoting transfer, but it is more under the control of the teacher. Learners may, unknown to the teacher, perceive situations as similar. Emotions may become associated but be undetected by the teacher. (Johnny fell off the fence rail at home. The balance beam looks similar and he is afraid to try to walk on it.) While we now know how to increase the degree of learning, we still do not control all learning. It is within the power of the teacher, however, to help learners identify and verbally label invariant elements. ("This is my right hand. Anything on this side of me is to the right." "If you face the outside of anything moving clockwise, it will move to your right." "The letter "b" has the circle on the right side of the line.")

To teach for the transfer of perceptual-motor skills to academic learning, the physical educator must assist learners to perceive similarities ("Drawing between these lines is like running between the pins."); associate appropriate learnings ("Remember how well you listened yesterday."); learn to an appropriate degree ("It's getting better each time; you'll soon do it perfectly."); and identify the unvarying elements which signal to a learner that a past learning should be used in a present situation ("which way will you make your number face?").

Abstract concepts such as sequence, seriation, categorization, and directionality can be taught in their concrete manifestation through movement, and those concepts can transfer to abstract cognitive behavior if connecting bridges are built. Movement will help a child think to the degree that he thinks about the movement in which he is engaged and to the degree that his teacher provides for transfer of perceptual-motor learning to academic situations where they are applicable.

In summary, while inferences and implications of research in perceptual-motor programs are speculative and must be stringently evaluated in a practical teaching-learning environment, we have taken the first steps to move us from stubborn ignorance to a thoughtful uncertainty which directs us to further investigation of this important field.

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FUTURE DIRECTIONS
ROUND TABLE DISCUSSION

Hope Smith
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Questions: There are concerns for guidelines for new programs for people who are unfamiliar and for people who are not here and want to start programs. Can we get guidelines for these people? Is there now a valid and reliable test that these people can use in evaluating existing and new programs? Where can we get such a test? Is there research that we do not know about? Is there research that we are not getting a hold of and how do we get a hold of it? How do we get information about projects and progress? Are funds for research available, and how does an individual or university go about getting research funds?

Dr. Smith: If there are research monies available, I would like to know where they are myself because several proposals have been sent to Washington as well as to smaller branch areas, and funds have not been forthcoming. If someone has information about where we can get money, I would like to have that information. As to what research is doing on my shelf and a number of other shelves, it occurred to me that one of the things the Task Force might do is establish a clearinghouse for unpublished works and studies in progress, as well as encourage people to write about what they have done or are currently doing. It takes about two years for a good piece of research to become public information after it is done. The lag in publication is very serious. The *Research Quarterly* has improved, but there are others where a lag still exists. Perhaps there is some way the Task Force could have a clearinghouse for all kinds of projects that are now ongoing and sitting on shelves that have not been reported as yet.

Question: What test instruments are available?

Dr. Smith: There are quite a few tests or instruments for evaluation that are now being used. The *Oseretsky Motor Assessment* and the *Purdue Perceptual-Motor Survey* are two that come to mind. There are some body image assessments also being used. Unfortunately, the validity and reliability of most of these instruments are open to question. One problem is that so much of the assessment is subjective on the part of the observer and if we know anything about perception, we know the observer is processing these incoming data in his own way. You are going to get differences of observations from different observers. I am making a plea for all of us who are involved in developing such instruments to go out and start working on valid, reliable tests that have a relationship not just to perception but to these motor acts and the environment in which motor acts take place.

For instance, there are many figure ground vision tests, most of them based originally on the old Gottschaldt test done in 1927. Are these appropriate tests for people who are moving and reacting to moving objects? Is the process the same? At Purdue, we are completing a film entitled *Moving Embedded Figures Test.* It has directions on the sound track and hopefully by the end of this year it will be available. This should be used probably within the moving situation rather than a sit-down paper-pencil test.

We do not have adequate tests. Until such time as these are developed we have to do the best we can with those that are available. Guidelines, I think, are another project for the Task Force. Let's draw up some guidelines for people going into these programs and make them available. These guidelines should include principles upon which we operate, areas to watch out for, and programs that have been effective.

Question: Will there be a compilation of names of persons who work with perceptual-motor development programs but who were not at the conference?

Dr. Smith: This will be arranged.

Question: What is a perceptual-motor consultant? You predicted changes in the elementary program and in the physical education program. What changes?

Dr. Smith: I would say that a perceptual-motor consultant is well versed in the interrelationships of the perceptual and motor systems. These systems are interactive, part of a great loop. A perceptual-motor consultant has great knowledge of the affective system as well as the effective system and their interrelationships. A perceptual-motor consultant is someone upon whom you could call who would perhaps know about different kinds of tests and program experiences. Such a person could help guideline people to set up certain types of programs or make changes in an existing program. That would be my definition.

As for the second part of your question regarding changes in elementary school – I presume you mean major preparation. Let's take the elementary school physical education program first. I believe that all good physical education teachers have been perceptual-motor workers all of their lives. Any good physical education teacher is, in effect, doing perceptual training to elicit certain motor patterns that are necessary for a child to have good body management and spatial orientation. We have been doing this, but have we been doing it correctly? We've made a guess and haven't thought about it too much. Intuitively, we've done some things that are awfully good, but intuitively I think we've done some things that are really bad, also. We have not studied or thought about the affective system enough. We haven't used enough of the information to set the very best learning environment for kids. As an example of this, we have a group of youngsters learning how to respond to objects coming at them through space. We set the environment in the gym, which has posters on the wall, lines on the floor, and a very complicated visual array. Then we expect the youngster to concentrate on one object.

If we could study the affective region, then the effective region would be helped. We would walk into classrooms that were really designed for best learning. I believe this is the reason why physical educators and others are saying perceptual-motor. We all know the one system, but putting perception first directs our attention to the input phase of the total system, which we have not paid much attention to in the past.

In elementary schools, current investigations show what is going on with young children that deals with body management education. Movement education, perceptual-motor training, or whatever you want to call it, should be employed at the very beginning levels of perceptual-motor development. That's where our money should be. By the time students are in high school, their perceptual and motor development is set. Therefore, most of our energy should be put into the preschool nursery school, kindergarten, first, second, and third grades while children are still in the process of development. I can see that this would be the program for all children and we would bolster the areas that occur in typical physical education programs. We should have been doing this for a long time. Some have.

As for changes in traditional physical education preparation programs, I think that if we examine the education offered to physical education majors, we will find they have two "fast" weeks in a child development course. This course is supposed to tell them all they should know about children. Then we have a game and materials course. Perhaps some of these new activities are finding their way into this course. Then, we concentrate on teaching physical education majors how to teach in junior and senior high school without their having any knowledge of how children got the way they are. The change I'm talking about is to include perceptual-motor development courses in the undergraduate course so that prospective teachers will have a good educational background and be able to teach at any level.

I see more emphasis on the affective system along with the effective system. We have looked at that frog muscle jumping too long. How did it get that way—this is what we need to study. I think we have to make clear to undergraduate education majors what the purposes of movement are, and what is it that physical educators are all about. What are concomitant outcomes like physical fitness? This is an outcome from moving in certain ways, but our main emphasis should be on movement education for good body management and good body spatial direction. In our major programs, let's change so that students are in at the ground floor so when they look at a 15-year-old girl in a volleyball class, they no longer say she has no coordination. They say she has the motor operations of a four-year-old and maybe it would be better to give her some tests that would help us prescribe the best way for her to receive the help she needs.

Question: Are we educating people to be perceptual-motor specialists to work with atypical individuals, or educating people to be knowledgeable about perceptual-motor development to teach every phase of physical education.

Dr. Smith: I think all physical educators need this kind of background and experience. If they are particularly interested in a specific area, they should elect courses in the special education department where atypical situations are studied. Our job is to give physical education students a background that will enable them to go into a special education course and know what is being discussed.

PART IV

RESOURCE MATERIAL

. . . we have taken the first steps to move us from ignorance to a thoughtful uncertainty which directs us to further investigation.

MADELINE HUNTER
Cincinnati, 1970

A SURVEY OF PROFESSIONAL PREPARATION IN PERCEPTUAL-MOTOR DEVELOPMENT

1970

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FULL COURSE OFFERINGS IN PHYSICAL EDUCATION

Course Title	R	E	U	G	F*
Motor Learning	x		x		3
Motor Learning		x	x		2
Psychology of Motor Learning			x		2
Theory of Motor Learning	x		x		
Motor Learning and Human Performance	x		x		2
Human Performance and Motor Learning	x		x		
Motor Learning and Behavior	x		x		
A Study of Factors Influencing Human Movt. & Skill Learn.			x		
Psychological Bases of Sport		x	x		
Psychosocial Factors in Motor Performance	x		x		
Proseminar in Motor Performance		x	x		
Principles of Perceptual-Motor Learning	x		x		
Perceptual-Motor Education		x	x		
Introduction to Movement and Perception	x		x		
Motor Learning				x	2
Motor Learning		x		x	3
Principles of Motor Learning	x			x	2
Seminar in Motor Learning	x			x	2
Fundamentals of Motor Learning		x		x	
Basic Principles of Motor Learning and Performance				x	
Motor Learning and Performance				x	
Nature and Basis of Motor Skills	x			x	
Psychomotor Basis of Skilled Performance		x		x	
Research Seminar in Motor Learning and Performance				x	
Motor Problems in Physical Education		x		x	
Human Performance and Skill Learning		x		x	
Perceptual Motor Learning of Physical Skills	x			x	
Movement and Perception	x			x	
Motor Behavior of Children	x		x		
Motor Performance in Childhood			x		
Human Growth and Motor Performance	x		x		
Physical Education for Early Childhood		x	x		
Perceptual-Motor Development of Elem. School Children			x		

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*R: required
E: elective
U: undergraduate
G: graduate
F: frequency

Course Title	R	E	U	G	F*
Perceptual-Motor Development and Its Relationship P.E.		x	x		
Movement Behavior in Children	x		x		
Practicum in Elementary School P.E.		x		x	
Age Characteristics of Motor Skills	x			x	
Seminar in Motor Development	x			x	
Motor Development of Children	x			x	
Motor Development				x	
Research in Elementary P.E.	x			x	
Perceptual-Motor Development		x		x	
Movement Performance and Physical Growth	x			x	
Movement Education Seminar		x		x	
Kinesiology and Adapted P.E.	x		x		
Teaching Adapted P.E.		x	x	x	
Adapted P.E.	x		x		2
Adaptations of Movement for the Handicapped	x		x		
Adaptives		x		x	
P.E. for Exceptional Children		x	x		
P.E. for the Exceptional Individual		x	x		
P.E. for the Atypical	x		x		
Motor Development of the Typical and Atypical Child	x		x		
P.E. for the Emotionally Disturbed Child		x	x		
P.E. for the Exceptional		x		x	
P.E. for the Exceptional Children		x		x	
Motor Activities for Children with Learning Disabilities		x		x	
Special Program for Neurologically Handicapped Child				x	
P.E. for Mentally Retarded		x	x		
Laboratory Class for Mentally Retarded		x	x		
P.E. for the Mentally Retarded				x	
P.E. for Mentally Retarded		x		x	
Motor Development for Mentally Retarded		x		x	
Principles of Therapeutic Recreation and P.E.		x	x		
Clinical Program for Corrective Therapy		x	x	x	
Clinical Program in Therapeutic P.E.					
P.E. for the Handicapped					
Motor Facilitation of Mental Functions					
P.E. for the Mentally Retarded					
P.E. for Children with Learning Difficulties					
Development and Remedial P.E.					

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*R: required
E: elective
U: undergraduate
G: graduate
F: frequency

CONCEPTUAL EMPHASES IN PHYSICAL EDUCATION COURSES

Learning	U	G*
Review of perceptual-motor activity	x	
Psychological aspects of M.L.; analysis studies and experiments	x	
Facilitating motor skill acquisition and performance	x	
Theoretical and empirical constructs in M.L.; affectiveness	x	
Developmental factors and psychological factors in performance	x	
Reaction time, kinesthesis; information theory; practice effects	x	
Theory and principles of P-M learning applied to gross motor perf.	x	
Psychological and social factors influencing motor performance	x	
Psychoneurological bases of motor learning	x	
ML performance and physical performance and affective variables, proprioception; research available		x
Research in ML performance; facilitating role of teacher		x
Research in skill acquisition		x
Mechanisms, factors, principles, theories, hypothesis in skill learning including P-M learning		x
Research in ML		x
Theory and practices in P-M learning		x
Developmental		
Elementary physical education: 4-year-olds	x	
P-M patterns in elementary school age children	x	
Research findings in P-M development and application	x	
Developmental study of ML and performance	x	
Relationship of P-M development to total development	x	
Effects of movement on conceptual, perceptual, other development	x	
Physical growth and motor performance factors		x
Role of motor experience in child's perception reality, concept formation; motor performance in reading and writing		?
Theory, research P-M development; all ages, emphasis preschool		x
Activities for young children (Head Start personnel)		x
Dysfunction		
Activities for mentally retarded	x	
Theory and clinical: corrective therapy	x	x
Methods for teaching mentally retarded	x	x
Methods of diagnosis and management of problems MR and learning disabled	x	
Physical and mental handicaps and appropriate programs for each	x	
Adaptation of P.E. to mental, physical, social needs of atypical	x	
Program modification for atypical	x	
Nature and problems of MR child in physical education programs		x
Principles and practice of P.E. for exceptional/atypical	x	x
Brain injuries: screening; activities; visuo-motor training		x
Remediation of learning disabilities: physical activity and P-M training contributions		x
Characteristics, problems atypical; P-M dysfunction	?	?
Theoretical aspects therapeutic recreation	?	?
Activity programs exceptional child, including P-M disabilities	?	?

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*U: undergraduate
G: graduate

EDUCATION COURSE OFFERINGS

Course Title	R	E	U	G
Educational adjustments for the Educationally Disadvantaged	x			x
Field Studies in Education of Learning Disabilities		x		x
Workshop and Lab for Education of Exceptional Children			x	x
Special and Educational Measurement			x	x
Motor Behavior		x		x
Psychology of Motor Learning		x		x
Survey of Physical Defects				
Diagnosis of Learning Disabilities				
Remediation of Learning Disabilities				
Education of Mentally Handicapped, Diagnostic and Corrective Techniques				

CONCEPTUAL EMPHASES IN EDUCATION COURSES

Learning disabilities: research and methodology
Teaching techniques, materials for disadvantaged child; problems
perceptually impaired, culturally deprived
Programs for teaching physically handicapped child
Treatment of specific learning problems
Choice, interpretation and administration of tests in exceptionality
Severe learning disability diagnosis
Severe learning disability remedial procedures
Diagnosis and remedial techniques in learning disabilities
Perceptual-Motor development

SELECTED UNIT EMPHASES IN GENERAL PHYSICAL EDUCATION COURSES*

Unit Labels
Movement Exploration
Perceptual-Motor Development
Perceptual-Motor Learning in Children
Perception
Motivation

Conceptual Emphases
Relation between P-M competency and slow learner
Program ideas for remediation of P-M deficiencies
Perceptual-motor handicaps
Development of gross and fine motor skills; relationship to P-M development
P-M process
Theories or theoretical constructs
Developmental sequences of P-M tasks

Elementary Physical Education
Professional Methods and/or Theory

BIBLIOGRAPHY OF FILMS (16mm) WITH PERCEPTUAL-MOTOR IMPLICATIONS

Jack Capon
Supervisor of Physical Education
Alameda Unified School District
Alameda, California

Film Title	Brief Description	Audience Designed for	Producer	Address	Color or B/W	Run. Time	Cost
And So They Move	Practical and meaningful experiences for physically handicapped children are presented with narration stressing the theoretical value of the activities.	Teachers Students Parents	Audio-Visual Center, Michigan State Univ.	East Lansing, Mich. 48824	B/W	20 min.	Unknown
Anyone Can	Shows rope, ball handling, stegel, and trampoli[illegible]tivities designed for the educationally handicapped child.	Teachers Parents Students	Bradley Wright Films (1968)	309 N. Duane, San Gabriel, Calif. 91775	Color	27 min.	$240
Bridges to Learning	Illustrates the organization and administration of a K-6 physical education program with emphasis on perceptual training and innovative curriculum.	Teachers Admin. Students Parents	Palmer Films, Inc. (1970)	611 Howard St., San Francisco, Calif.	Color	30 min.	$250
Creative Body Movements	Shows how children can express themselves through movement using a perceptual-motor and problem solving approach (primary grade level).	Teachers Children	Martin Moyer Productions (1969)	900 Federal Ave. E., Seattle, Wash. 98102	Color	11 min.	$125
Developmental Physical Education	Demonstrates a sequential perceptual-motor and physical fitness program for special education children in a public school setting.	Teachers Parents Students	Dr. Louis Bowers	Simensen & Johnson, Ed. Consultants, P.O. Box 34, College Park, Md. 20740	Color	28 min.	Unknown
Discovering Rhythm	Demonstrates to children that rhythm is an outgrowth of normal activities such as walking, running, etc. Child is taught basic concepts relating to rhythm.	Children Teachers	Universal Education & Visual Arts (1968)	221 Park Ave. S., New York, N.Y. 10003	Color	11 min.	$120
Innovations in Elementary Physical Education	Depicts a wide variety of movement activities and equipment designed for use in the K-6 grade programs.	Teachers Students	Crown Films (1969)	W. 503 Indiana Ave., Box 890, Spokane, Wash. 99210	Color	30 min.	$229
Just For The Fun Of It	Presents activities for mentally handicapped that can be accomplished using ropes, hoops, balance beams, etc.	Teachers Children	Orange County Office of Education	Educational Media Center, Civic Center Dr., Orange County Office of Education, Santa Ana, Calif. 92701	Color	20 min.	Unknown
Learning Through Movement	Children from K-6 grade levels are shown responding to verbal and rhythmic cues. Creative expression is brought out.	Teachers Children	S & L Film Productions (1966)	5126 Hartwick St., Los Angeles, Calif. 90041	B/W	32 min.	$165

Film Title	Brief Description	Audience Designed for	Producer	Address	Color or B/W	Run. Time	Cost
Movement Exploration	Includes a wide range of movement activities for K-6 grade children with an emphasis on involvement of each child in a problem solving approach.	Teachers Children	Documentary Films (1967)	3217 Trout Gulch Rd., Aptos, Calif. 95003	Color	20 min.	$185
Movement Exploration What Am I?	Children are shown how they can use their bodies to move in many different ways (K-primary).	Children Teachers	Film Assoc. (1968)	11559 Santa Monica Blvd., Los Angeles, Calif. 90025	Color	11 min.	$125
Movigenic Curriculum	Presents Dr. Barsch's special curriculum for the educationally handicapped. A wide range of perceptual-motor activities is shown.	Teachers Students Parents	University of Wisconsin Bureau of A/V Instruction	University Extension, 1312 W. Johnson, Madison, Wisc. 53701	B/W	30 min.	Unknown
Moving Is Learning	Demonstrates methods of assisting perceptually handicapped children through perceptual-motor retraining techniques at a visual learning center.	Teachers Parents	Canadian Assoc. for Children With Learning Disabilities	Suite 322, 88 Eglinton Ave., E., Toronto 315, Ontario, Canada	Color	18 min.	$175
Perc! Pop! Sprinkle	Provides a series of visual experiences for children to perceive and then to interpret motorically (primary grade level).	Teachers Children	Martin Moyer Productions (1969)	900 Federal Ave. E., Seattle, Wash. 98102	Color	11 min.	$125
Perceptual Development Workshop	Describes workshop activities conducted for teachers.	Teachers	Board of Education, Palm Beach, City, Fla.	Admin. Annex Bldg. S-501, 6th St. N., Palm Beach, Fla. 33401	B/W	45 min.	Unknown
Physical Education – Level to Learning	Educable mentally retarded children in a public school special education program are shown taking part in a vigorous and varied program emphasizing development of motor skills and fitness. Use of inexpensive equipment is demonstrated.	Teachers Parents Students	Stuart, Finley, Inc. (1969)	3428 Mansfield Rd., Falls Church, Va. 22041	Color	20 min.	$200
Sensorimotor Training	Describes philosophy and training methods for helping preschool children develop sensory skills and physical coordination (Dayton Public Schools Program).	Teachers Parents Students	Valdhere Films (1968)	3060 Valleywood Dr., Kettering, Ohio	Color	24 min.	$135
Thinking-Moving-Learning	Shows perceptual-motor and movement activities for K-primary level children.	Teachers Specialists Students Children	Bradley Wright Films (1970)	309 N. Duane, San Gabriel, Calif. 91775	Color	20 min.	$210
Visual Perception and Failure to Learn	Illustrates the effect of a disability in visual perception upon learning. Disabilities are identified and explained using Frostig Visual Perception Tests.	Teachers Parents Specialists	Churchill Films	662 N. Robertson Blvd., Los Angeles, Calif. 90069	Color	20 min.	$150
Why Billie Couldn't Learn	Focuses on the diagnosis and teaching techniques used in a special classroom for neurologically handicapped children.	Teachers Parents	Calif. Assoc. for Neurologically Handicapped Children (1967)	Film Dir., P.O. Box 604, Main Office, Los Angeles, Calif. 90053	Color	40 min.	$250

Special Notation: This is *not* an exhaustive list of 16 mm. films relating to perceptual-motor development, but only those films which have been brought to the attention of the AAHPER Perceptual-Motor Task Force. These films were recommended for listing on returns of a recent film survey form sent out to multidisciplinary persons throughout the country. This list will be expanded periodically as other films are previewed and recommended for listing.

Prepared by: Jack Capon, in cooperation with the AAHPER Perceptual-Motor Task Force, April 1970.

A SELECTION OF TESTS, PROGRAMS, AND MATERIAL SOURCES OF PERCEPTUAL-MOTOR DEVELOPMENT

ROBERT E. McADAM
With Permission and Assistance
From Susan T. Rydell

Some Tests, Training Programs, and Materials: Perception and Perceptual-Motor Development

Susan T. Rydell
Department of Special Education
University of Minnesota

Over the last few months, letters were sent to various organizations and publishing companies requesting information pertaining to tests, training programs, etc. in the area of perception and perceptual-motor development. The following list contains the title of each item, author(s), if any, the publisher or organization, a brief description of the item, and the item's cost. The list was ***based only on information received in reply*** to the original letter. If the information received had statements pertaining to norms and standardization, reliability and validity, or the item's demonstrated usefulness, this is included in the description of the item. If statements were documented or a bibliography was included, this also is noted in the item's description. Only one "representative" price is given for each item—in most cases, prices varied according to quantity, model selected, etc. Quotations, unless otherwise specified, were taken from publisher's notes. A publishers' address list appears on page 159.

Note: The project herein was performed pursuant to Grant No. OEG-0-9-331295-3408 (031), from the U.S. Office of Education, Department of Health, Education, and Welfare, to Dr. Maynard C. Reynolds. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

Alphabet Cards
Educational Media

"Cards 2¾" by 4¼", lower case upper case reverse, designed for desk work by the individual student. 26 letter cards, 3 blank, instructional sheet, each set enclosed in self-seal polyethyline envelope."

Set. $1.00

Ambco Speech Test Record
Ambco Electronics

"The Ambco Speech Test Record, 1161 is now available for use with all Ambco Speech Audiometer, Model A-17, as well as for use with other audiometers. . . .

"The record is a 12", long play, 33 1/3 rpm (sic.) unbreakable. One side contains Phonetically Balanced Words list and the Spondaic Words list for use in determining speech reception thresholds for both child and adult. The other side of the record lists 'Sound-Alike' words and 'Fading Numbers.'"

Record. $5.00

The Art of Seeing
Warren Schloat Productions, Inc.

"*The Art of Seeing* is a series of six color sound filmstrips which introduces the student to the language of visual perception and expression. It teaches its lesson in a way which will erase the student's fear of fine arts and stimulate him to make his own discoveries about painting, sculpture, architecture, and other media." Filmstrips deal with how to use your eyes, lines, colors, shapes, and space.

Filmstrips, records, teacher's guide $84.00

Auditory Discrimination Test
by Joseph M. Wepman
Language Research Associates

"This is a test for determining the auditory discrimination ability of 5-, 6-, 7-, and 8-year-old children as a method for predicting articulatory speech defects and certain remedial reading problems. It is the product of over twelve years of experimentation and in its present form has complete phonetic and phonemic balance.

"Research based on the test and its relation to speech and reading problems is to be found in the literature (bibliography available upon request).

"The test is produced in two equated forms (Intercorrelation, r=.94). This provides a useful test-retest evaluation method for checking reliability, as well as an excellent method for progressive testing during speech therapy or remedial reading."

Test manual, 50 test forms, class record $6.00

Ayres Space Test
by A. Jean Ayres
Western Psychological Services

"A widely used performance test for children and adults (normative data for ages 3-10 years) with visual perception impairment. An excellent instrument for difficult cases such as incoordinated, aphasic, and neurological. Measures spatial ability, perceptual speed, and directionality or position in space in approximately 20-30 minutes."

Test materials, manual, 25 protocol booklets $25.00

Basic Concepts Through Dance (Body Imag
by Dorothy B. Carr and Arden Jervey
Educational Activities, Inc.

"These dances were especially selected to develop and reinforce self-concepts in children who are mentally retarded and/or physically handicapped with neurological impairments. Children are encouraged to become aware of the use of their whole body with appropriate movements of the head, trunk, arms, hands, legs, and feet."

1 12", 33 1/3 rpm record $5.95

Basic Concepts Through Dance (Positions in Space)
by Dorothy B. Carr and Arden Jervey
Educational Activities, Inc.

"This album uses the medium of the dance to help pupils develop and improve their perceptual-motor skills. The dances selected can help pupils with an inaccurate concept of their relationship to space around them and the relationship of space to them. Pupils are encouraged to move the whole body, as well as their individual limbs in many directionality and laterality activities."

1 12", 33 1/3 rpm record $5.95

Basic Quantity-Number Set
Educational Media

"This very basic arithmetic set consists of a sturdy workcard (as shown), ceramic squares to fit on the work-card, answer number-cards (1 through 10) and an instructional sheet. To increase the task demands, the reverse of the work-card is as shown but without the printed numerals so that the student must fit the appropriate number-card to the quantity shown. The set is attractively packaged in a large self-seal polyethylene envelope which can be left over the work-card for practice sessions. A small self-seal envelope is used to contain the ceramic squares and small answer number-cards."

Set $1.50

Bender Visual Motor Gestalt Test
by Lauretta Bender
The Psychological Corporation

"A diagnostic and experimental technique of interest to clinicians and research workers. The subject reproduces a series of designs, his departures from the originals being interpreted in terms of the Gestalt laws of perception and organization." The American Orthopsychiatric Monograph No. 3 reports studies on children and adults. Pascal and Suttell's text gives protocols for scoring practice and case discussions. A scoring system for children's protocols is in the text by Koppitz.

Monograph, design cards, and directions. . . . $6.00 ***(Sale restricted to qualified persons.)***

Block Design Set
Educational Media

"In this introductory training set, the student is introduced to the principles of varied configurations found in design patterns. As a basic beginning, the learner manipulates 16 wooden cubes (red, green, blue, yellow, and black) to reproduce design patterns described in the training instructions enclosed with each set."

Set $1.95

Children's World–Holt's Early Childhood Program

by Margaret Wettlaufer, Margaret Deeth,
Ruth Devry, and Rae Smart
Holt, Rinehart and Winston, Inc.

"Children's World is a developmental program designed to excite the natural curiosity of every young child. It is built around a core of resource materials and nine sequential interest units (pets, fall, special days, winter, home and community, spring, transportation, summer, animals)–all housed in a large colorful wooden chest.

"*The materials* are multisensory and multipurpose–over fifty child-size components which are specifically designed for their educational value, versatility, durability, eye appeal, and safety.

"*The approach* is conceptual-developing basic concepts in social studies, mathematics, science, language arts, music, and fine arts.

"*The organization* is flexibility structured–building concepts at several levels of development: Manipulative, semi-abstract, abstract.

"*The goal* is the creation of a responsive classroom atmosphere–one in which each child explores his individuality and his relationship to the world around him. . . ."

Program $297.00

Daily Sensorimotor Training Activities: A Handbook for Teachers and Parents of Pre-School and Primary Children

by William T. Braley, Geraldine Konicki,
and Catherine Leedy
Educational Activities, Inc.

"NEW! This book contains daily plans for a complete school year program for increasing perceptual awareness and motor ability in young children. Many of the activities can also be done easily in the home. Comprehensive evaluations are included at the end of each week to so that the teacher can check her classes' progress. Material introduced includes: body image, space and direction, balance, basic body movement, hearing discrimination, symmetrical activities, eye-hand coordination, eye-foot coordination, form perception, rhythm, large muscle, fine muscle, and games."

Book $4.95

Detect: A Sensorimotor Approach to Visual Discrimination

by Lawrence N. Gould
Science Research Associates, Inc.

"This outstanding new program from SRA helps the child develop essential perceptual and cognitive skills in the early learning years that he will need throughout his schooling.

"The program utilizes the tachistoscopic method of presentation, whereby the teacher, using an overhead projector, flashes an image on the screen briefly (1/25th of a second) and the student must then mark in his own workbook a symbol corresponding to the image. This exercise is beneficial to the student in many ways; he acquires needed practice in coordinating 'near point' and 'distant' tasks, he learns to make immediate decisions and therefore builds self-confidence, and in the discussion that follows each problem, he learns to express his reasons for his decisions.

"Obviously, there's much more to *detect* than meets the eye–and much more than we can explain here. For more information about this stimulating new program for early childhood education, write today or contact your SRA Staff Associate." For preschool, kindergarten, and primary grades.

No price list received.

Developing Learning Readiness

by G. N. Getman, Elmer R. Kane,
Marvin R. Halgren, and Gordon W. McKee
McGraw-Hill Book Company–Western
Division

A program to develop visual, motor, and tactile skills consisting of an "introductory" program and six programs: The Magic of Movable Melvin, Practice in General Coordination, Practice in Eye-Hand Coordination (Chalkboard), Practice in Eye Movements, Practice in Recognition (Templates), and Practice in Visual Memory (Imagery). The program uses the following components: Teacher's Manual, Webster-masters, Movable Melvin (Teacher's Model and Children's Models), Targets, Space Masks, Eye Movement Charts I, II, and III, Space Sighters, Chalkboard Templates, Triple Sized Chalk, Desk Templates, Filmstrips, Walking Beam, and Tachistoscopic Flashing Device. For preschool and elementary school children.

No price list received.

Developing Perceptual-Motor Needs of Primary-Level Children

by Dorothy B. Carr and
Bryant J. Cratty
Educational Activities, Inc.

"The album provides a sequentially-developed training program to help pupils establish necessary perceptual-motor skills. From three to eleven exercises are included in each aspect of the program.

"The training includes the sequential development of the following: Agility, Balance, Combination Balance and Locomotor-agility, Turning Locomotor-agility, Complex Locomotor-agility, etc."

2 12", 33 1/3 rpm records $11.90

The Developmental Test of Visual-Motor Integration—VMI

by Keith E. Beery and Norman Buktenica
Follett Educational Corporation

"We now know that the functional integration of visual perception and motor behavior is necessary if children are to be better prepared for academic work.

"*The Developmental Test of Visual-Motor Integration* is a series of 24 geometric forms that a pupil is asked to draw. Inadequate performance on the test may reflect problems in visual perception, hand control, and coordination between the two.

"The forms are arranged in order of increasing difficulty. The test can be administered to children in the age range of two to fifteen years, but it is designed primarily for the preschool and early primary grades. . . .

"Since visual-motor behavior is a composite of other behaviors, techniques for determining specific areas of difficulty are provided. Because the goal of assessment is improved educational programming, the Administration and Scoring Manual suggests teaching techniques and other materials for use by the student."

100 tests, manual, monograph, worksheets. $70.29

The Development of Body Awareness and Position in Space

by Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

"The album provides a researched and sequentially-developed training program to help the pupil establish an accurate awareness of his body and its position in space. From one to four exercises are included in each step. The program develops from perception of body surfaces through directionality of self and other objects."

1 12", 33 1/3 rpm record $5.95

Development Sequences of Perceptual-Motor Tasks

by Bryant J. Cratty
Educational Activities, Inc.

"This practical and needed book provides a rationale for the use of motor activities for the retarded and neurologically handicapped as well as exact procedures for the evaluation and improvement of basic motor attributes. All who work with mentally retarded and/or other children who evidence mild to moderate neuromotor problems will find this book of special value.

"A variety of sequences to enhance balance, body-image, agility, locomotor ability, eye-hand coordination, manual dexterity, ball skills and classroom learnings through movement are given. When necessary, the sequences are illustrated. Each chapter contains a simple evaluation test or tests to measure the needs of the child; general norms for performance of these tests are presented."

Book. $2.95

The Dubnoff School Program/1 Level 1: Sequential Perceptual-Motor Exercises

by Belle Dubnoff and Irene Chambers
Teaching Resources

"The Dubnoff School Program/1 Level 1 is directed at the development of fine motor control, orientation to starting and stopping points, and the inhibition of perseveration. . . . Incentive for achievement is provided in Good Work Award sheets which are given for the completion of designated segments of each section.

"One of the main objectives of the program is to establish a habit of visual orientation to the upper left hand corner of the page, which is basic to successful reading and writing. The use of color at this important position is designed to focus the child's eyes on the proper starting point. The use of red and green has been incorporated for associative purposes and to promote motor control. Each exercise has supplementary activities included as suggestions on the Instructor's Guide.

"This program may be used diagnostically to help determine a child's mastery of basic perceptual-motor skills and may be used to increase ability in areas in which a child shows deficiencies. Children without perceptual deficits will benefit from this basic pre-academic activity and those who do suffer learning disabilities will receive training to enable them to progress academically." For preschool and primary grades.

Program and guide. $14.00

The Dubnoff School Program/1 Level 2: Experiential-Perceptual-Motor Exercises

By Belle Dubnoff, Irene Chambers, and Florence Schaefer
Teaching Resources

"The Dubnoff School Program/1 Level 2 is designed to develop fine motor control for the mastery of directional changes and multiple strokes. This program offers advanced perceptual-motor training through the use of high interest illustrations that are related to actual experiences. These illustrated exercise sheets help the student to translate specific perceptual-motor activities–such as those encountered on the playground or in neighborhood play–into more abstract interpretations. This material thus acts as a bridge between perceptual-motor and conceptual abilities. Incentive for achievement is provided by means of Good Work Award sheets, which are given upon completion of designated segments of the program.

"One of the prime objectives of Level 2 is to establish the pattern for responding to visual and auditory clues. The use of red and green color has been incorporated for associative purposes and to inhibit perseveration. . . .

"Although Level 2 is designed to follow Level 1, it is in itself a complete program." For preschool and primary grades.

Program and guide. $12.00

The Dubnoff School Program/2: Directional-Spatial-Pattern Board Exercises

by Belle Dubnoff and Irene Chambers
Teaching Resources

"The Dubnoff School Program/2 is designed to aid in the training of children for spatial and directional orientation as well as many other school-related and functional skills. . . .

"The exercises in this program are designed to aid in developing coordinated control of both hands simultaneously as well as firm finger grasp and awareness of finger position. . . .

"The program is introduced to the child with an Orientation Program which provides preliminary exercises in body image, directionality, sequential concepts and grasp training. The child is taught to proceed from left to right and top to bottom, which is basic to successful reading and writing.

"The exercise pattern cards in the Dubnoff School Program/2 are used in conjunction with a pattern board and the child is asked to reproduce the pattern or its mirror image with colored rubber bands, first by means of superimposition and then by visual copying. The pattern cards follow a developmental progression from simple to complex designs requiring a high degree of visual discipline and visual-motor organization. The overall structure of the program allows the choice of independent student or group performance. . . . Adaptable to every age level from the preschool child to the adult, with special emphasis on children aged five to eight years."

Program and guide. $29.00

Dynamic Balancing Activities

by Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

"NEW! Activities described in this album range from simple to more complex line-walking tasks. Research seems to find that in motor performance, balance is an important constituent. The material in this album is useful for training the child in both static and moving balance activities and is combined with various tasks which should heighten the child's awareness of his body image. All material has been carefully researched, sequenced and prepared. The record has clear, oral instructions with interesting musical accompaniment. Use of this album can free teachers to work more closely with children in the class. The records also may be used independently by students for practice until necessary skill development has been achieved."

2 12", 33 1/3 rpm records $11.90

Dynamic Balancing Activities–Balance Beam Activities

by Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

"NEW! The material in this album attempts to correlate balance and body-image activities. The activities are carefully sequenced from simple walking in various positions on the beam to more complex patterns in which extra stresses are placed on the beam to make greater demands on the pupil. A range of activities has been provided so that all children may be challenged with novel and complex balance activities. In addition, stimulation of pupil creativity is a unique feature of this record. To correct inappropriate visual-motor integration, important in good motor developmental programs, some of the tasks presented help a child to walk a balance beam without watching his feet."

2 12", 33 1/3 rpm records $11.90

Engelmann Basic Concept Inventory

by Siegfried Engelmann
Follett Publishing Company

". . . is a simple test to be given individually to young children to find out whether they understand some of the basic concepts they must know to be successful in school. It tests understanding of such basic concepts as *not* and *more than one*. It shows whether a child is familiar with conventional statements and can understand them. It shows whether he can perceive patterns. . . ."

Manual, set of cards, 100 tests. $19.32

Erie Program/1: Perceptual-Motor Teaching Materials

by Daniel A. Hatton, Frank J. Pizzat,
and Jerome M. Pelkowski
Teaching Resources

"Erie Program/1 is a series of perceptual-motor exercises organized in a game format to increase motivation and interest.

"The first of the program's three units is a series of Visual-Perceptual Exercises. As the child plays the game, he learns to distinguish certain forms, first using color as an aid, then without color, and finally with color and design as distracting elements. These exercises are designed to improve his tactile and spatial perception.

"The second unit, Perceptual Bingo, is a variation on the familiar 'bingo' format. Its exercises are presented in an order of increasing difficulty from form discrimination to form conceptualization. An important feature of this unit is a unique control factor permitting the instructor to allow a 'win' or positive achievement for a student in need of this encouragement.

"The third unit is a set of Visual-Motor Template Forms to be used as the terminal exercise series with either one of the first two units. It is designed most particularly for children who may have motor problems which interfere with the proper execution of required movements." For primary levels.

Set (for six students) and guide. $77.00

Evanston Early Identification Scale

by Myril Landsman and Harry Dillard
Follett Publishing Company

"*The Evanston Early Identification Scale* is a highly efficient device for identifying children who can be expected to have difficulty in school. The test may easily be administered to a group or an individual by the classroom teacher. Children are asked to draw the figure of a person. The drawing is scored by the teacher through the use of a ten-item, weighted scale. . . .

"The EEIS is valid for children between the ages of five years and six years three months. Except in case of mental retardation, intelligence does not significantly influence the test results. Ideally, it should be administered in the spring of the kindergarten year so that the children will be familiar with drawing materials."

100 tests, teacher's manual. $9.96

Exer-Cor Apparatus

Marietta Apparatus Company

An apparatus allowing a subject to perform various creeping exercises while remaining in place. Following a controlled creeping program, physical and mental abilities and mental and manual skills "apparently tend to improve." Exercise on this machine may lower your golf scores, raise your bowling average, and improve your reading and writing. For further information about this miraculous machine, see p. 22 of the Marietta Catalog No. 69.

Exer-Cor Apparatus. $99.50

Eye-Hand Manipulation Set

Educational Media

"In this set, containing 40 wooden objects, the student is called upon to produce a fine response in eye-hand coordination. The correlation between this skill response and the ability to manipulate writing tools makes such exercises of vital importance to the young child, and of particular importance in the training of the culturally deprived or handicapped student."

Set. $2.25

Fairbanks-Robinson Program/1 Level 1: Perceptual-Motor Development

by Jean S. Fairbanks and Janet I. Robinson

Teaching Resources

"Fairbanks-Robinson Program/1 Level 1 presents in basic form tasks to develop those perceptual-motor abilities regarded as prerequisities to academic functioning. The tasks are designed for most effective use with a maximum of two children at a time. Full advantage should be taken of the reusable nature of many of the exercise pages, thus allowing reinforcement through repetition.

"Each of the sections includes a number of large exercise sheets with attractively printed designs for tracing, coloring, matching, selecting, and cutting. In use, the sheets are placed beneath a protective acetate panel. Crayon markings are easily removed from the protector with a damp tissue or soft cloth. To develop motor ability, extensive finger tracing is used before experience with crayons."

The various sections of the program deal with line-movement exercises, shape recognition and discrimination, coloring and cutting exercises, spatial orientation, constancy of form and size, figure-ground discrimination, spatial relations, and spatial relations presented in puzzle form.

Program and guide. $79.00

Fairbanks-Robinson Program/1 Level 2: Perceptual-Motor Development

by Jean S. Fairbanks and Janet I. Robinson

Teaching Resources

"Fairbanks-Robinson Program/1 Level 2 covers the significant areas of perceptual-motor development in depth, making use of visual, manipulative and coordinative experiences. Although Level 2 is a continuation and advancement of Fairbanks-Robinson Program/1 Level 1, it is a complete program in and of itself. . . .

"The first of eleven sections (Section A) reinforces at a higher level the left-to-right movement, top-to-bottom progression, and rhythmic performance established in Level 1. Section C stresses the development of eye-hand coordination and dynamic hand coordination through the use of scissors. Section E deals with the ability to discriminate visually in the spatial orientation process.

"Introduced in Level 2 for the first time are line and form reproduction (Section B), as distinguished from recognition and discrimination at Level 1; discriminating for similarities and differences of lines and forms (Section D); visual tracking and the imbedding of figures in figure-ground exercises (Section F); experiencing spatial concepts through three- and two-dimensional activities, reproducing color sequences, and ordering of forms by size (Sections G and H); part-whole organization (Section I); design copying (Section J); and spatial relationships involving the assembly of puzzle pieces without content clues (Section K)."

Set and guide. $69.00

54 Functional Words

Warren Schloat Productions, Inc.

"Fifty-four functional words uses a multisensory approach–visual, kinesthetic and tactile–in teaching the functional words and signs of everyday life to your primary and special educational classes. This unique classroom-tested series is designed especially for classes of exceptional children, but will also prove useful for all primary classes and for adult education for the foreign born."

Filmstrips, flashcards, workbook, teacher's guide. $68.00

The Fitzhugh PLUS Program

by Kathleen Fitzhugh

Allied Education Council

"New-Revised–The Fitzhugh *PLUS* Program in perceptual training and language and number concepts for children with learning disabilities, limited cultural backgrounds and readiness needs. Nine individualized instruction workbooks with self-scoring plus marker. New–complete student placement guide and teacher's manual.

"The Fitzhugh *PLUS* Program was developed to provide classroom materials for children with learning disabilities. The nine workbooks incorporate an effective self-teaching process for individualized learning. The Fitzhugh *PLUS* Program was designed as a supplementary curricular approach and therefore should be used in conjunction with other materials and techniques. The materials may be used as a remedial and/or preparatory program."

The program covers the following areas: shape matching, shape completion, alphabet and common nouns, action verbs, addition, subtraction and multiplication, shape analysis and sequencing, narrative problems and division, and grammar and general knowledge.

Special introductory price on examination set. $16.00

The Frostig Program for the Development of Visual Perception

by Marianne Frostig and David Horne

Follett Educational Corporation

"The Frostig Remediation Program: The Frostig Program for the Development of Visual Perception, in the format of worksheets divided into the five areas of training (visual-motor coordination, figure-ground, perceptual constancy, perception of position in space, perception of spatial relationships), is recommended for remedial work for children with known or suspected visual perceptual problems. Because the exercises are divided into the five areas of training (unlike the Pictures and Patterns Program), their use can be precisely geared to results of the Standardized Frostig Test, if available. . . .

"The Teacher's Guide for the Remediation Program gives complete directions for a visual perceptual program geared to specific problems. The step-by-step directions for the worksheets are given in order of difficulty for each of the five visual perceptual areas. Equally important are the directions for physical and manipulative exercises for each of the five areas."

Program box (set of 359 spirit masters and teacher's guide. $98.62

The Pictures and Patterns Program materials consist of three Student's Books (Beginning, Intermediate, and Advanced Levels), transparent overlays so students can repeat the exercises in the books, and three Teacher's Guides. "Each of three Teacher's Guides gives the teacher specific directions for physical exercises, three-dimensional activities, paper-and-crayon exercises, and the procedures for carrying out the program. The page-by-page directions for the exercises in the Student Books give the objectives of each exercise, how to present it to the children, what skills are involved, and what results may be expected.

"The guides also briefly explain visual perception and the five areas with which the program is concerned, define and explain terms, and discuss common visual perceptual problems."

Program (3 student's books, 3 teacher's guides, 15 overlays). $11.22

The Hollien Thompson Group Hearing Test

Language Research Associates

"A new group screening test for auditory acuity. . . . It is easily administered, scored and interpreted. It takes only a few moments to test up to 40 children at a time. It determines which children have a hearing loss and are in need of an individual hearing test. It has established reliability and validity. It is economical–costing only a few pennies per child. It is administered most often by the school nurse or other health related personnel."

Test kit, 50 forms (Introductory offer–for a limited time only!). . . $11.00

Integrated Development: Motor Aptitude and Intellectual Performance

by A. H. Ismail and Joseph J. Gruber

Charles E. Merrill Publishing Company

"Provides comprehensive evidence to define the relationship between perceptual-motor and intellectual development.

"Makes a three-pronged inquiry into the mental-physical relationship. *Factor-analysis* technique provides evidence concerning the factor structure patterns of motor and intellectual variables. Assimilates this data by the *multiple regression* technique to support the hypothesis that intellectual performance can be predicted accurately from motor performance. Data and analysis further demonstrate that specific motor variables–coordination, balance and kinesthetic items–are superior indicators of intellectual proficiency. *Controlled experiments* seek to determine the specific nature of the relationship–to what degree causal, to what degree positive propensity–between motor and mental abilities.

"Offers motor evaluation scaling systems which make it possible to approximate Otis I.Q. and Stanford Academic achievement ratings from motor performance scores. Enables the teacher or counselor to evaluate a child's abilities without the possibly repressive effects of formal testing and observation."

1967 224 pp. $4.95

LADOCA Aids for Teaching the Mentally Retarded

by Roy McGlone

LADOCA Project and Publishing Foundation, Inc.

A series of exercises using a variety of objects and materials. Each exercise is accompanied by an illustrated description of the materials, the procedure, and objectives of the exercise. (A booklet describing the materials and exercises was received). Three kits of materials are available: Aids for Perceptual Training; Aids for Advanced Perceptual Training; and Aids for Number Perception. Developed for the mentally retarded.

Three kits $104.25

Learning to Move and Moving to Learn, Book 1, Insects

by Wanda Arbuckle, George Cornwell,
and Eleanor Ball
Charles E. Merrill Publishing Company

"Relates learning disabilities to a lack of perceptual-motor abilities. Provides motivation for the development of body movements with the greatest efficiency.

"Provides songs with accompanying illustrated postural activities to encourage natural rhythmic body movement."

Forthcoming. . . .price to be announced.

Listen-Hear Books

by Jan Slepian and Ann Seidler
Follett Educational Corporation

". . . a new approach to teaching auditory discrimination. As an educator you recognize that the ability to discriminate between sounds is basic to speaking and reading ability. Auditory discrimination is an essential part of the curriculum for preschool, Head Start, kindergarten, and primary grades. . . especially for disadvantaged children. You will find that speech specialists Jan Slepian and Ann Seidler have provided just the materials to fill this need. . . the *Listen-Hear* Books and accompanying materials."

Junior Listen-Hear classroom package (preschool–grade 1). $22.35

Listen-Hear classroom package (Grades 1-3). $18.12

The Marianne Frostig Developmental Test of Visual Perception

by Marianne Frostig, Welty Lefever,
and John R. B. Whittlesey
Consulting Psychologists Press

"This test yields scaled scores in five different perceptual areas, enabling the examiner to identify both strengths and handicaps. These areas are: I. Eye-Motor Coordination. II. Figure-Ground. III. Constancy of Shape. IV. Position in Space. V. Spatial Relationships.

"A paper and pencil test requiring no expensive equipment, the Frostig Test may be administered to small groups as well as to individual children. Normative data based on 2,116 normal children between the ages of 4 and 8 is reported in quarter-year intervals. Overall results may be recorded in Perceptual Quotients, which readily reveal a child's deviation from the expected perceptual development for his age level."

Examiner's kit (manual, monograph, 10 test booklets, 1 set of demonstration cards and 1 set of plastic keys). $10.50

The Massachusetts Hearing Test

by Philip W. Johnston
Massachusetts Department of Public Health

"An arrangement may be easily made whereby a complete pure tone screening test can be given to 10 children at a time. The accuracy obtainable with the group test closely approaches the accuracy of individual sweep check screening tests.

"Experimental work and field trials carried out over a period of the past 21 months have combined to set up definite recommendations with respect to equipment and procedure for this group screening test. The Massachusetts Department of Public Health has acquainted audiometer manufacturers with test details with the result that leading manufacturers now modify audiometers sold for school use so that they may be easily adapted for the group test." (Johnston, an efficient group screening test, *Journal of Speech and Hearing Disorders*, 1952, *17*, 8.) Received reprints of several articles as well as a copy of the test.

Massachusetts Vision Test

Welch Allyn, Inc.

"This equipment is an obsolete item and no longer available." (Letter from C. M. Evans, Vice-President, Welch Allyn, Inc.)

Memory-For-Designs-Test (MFD)

by Frances K. Graham
and Barbara S. Kendall
Psychological Test Specialists

"A simple drawing test of perceptual-motor coordination, depending on immediate memory and suitable for use in the age range 8.5 to 60 years. Experience and research since 1945 have established the MFD as an extremely sensitive detector of brain injury of many types. Testing usually takes less than 10 minutes.

"It is used for quick, effective differentiation of functionally-based disorders from those ordinarily associated with brain injury, in situations ranging from the classroom to the neurological clinic. Quick screening allows more appropriate use of much more expensive (in terms of time and equipment) psychological and medical examining procedures, since false positives can be almost completely eliminated. Useful wherever the tester would like to observe perceptual-motor performance in a standard situation."

Additional information pertaining to materials, procedure, scoring, standardization and norms, reliability, validity, and possible research uses was included. Most statements were documented; reference list was included.

Tester's set. . . . . $8.50 (Orders must be accompanied by a statement of the tester's name and the qualifications of the person responsible for the test's ethical use.)

Michigan Language Program

Donald E. P. Smith, General Editor
Ann Arbor Publishers

"The Michigan Language Program is a self-instructional language arts curriculum. Reading, writing, listening and speaking skills result from responses to thousands of carefully engineered tasks, perfected during a five-year period of development. They take the learner from no knowledge of reading to independent word attack. The program consists of: 1. A set of self-instruction booklets and tapes, and 2. Provision for their use in a controlled classroom environment.

"The program was developed in a classroom and was found to be most effective when the teacher managed the class in particular ways. Self-instruction in classroom management techniques for the teacher is provided in the manual. . . .

"The program begins with basic visual and auditory skills, then progresses to words, sentences and paragraphs.

"Systematic training is provided in the perceptual skills necessary for primer reading." Validity information was reported; some specific references were cited.

Examination kit ("Complete overview of Michigan Language Program with samples from and rationales for each book."). $25.00

Michigan Tracking Programs: Symbol Tracking

Ann Arbors Publishers

"To correct a deficit in auditory memory.

"For use with students exhibiting poor memory for word groups, inattention, distractibility, and forgetfulness."

1-10 copies, per copy. $1.25

Michigan Tracking Programs: Visual Tracking

Ann Arbor Publishers

"To correct a deficit in visual discrimination.

"For use with students exhibiting reversals, inversions, omissions, errors in oral reading, slow rate, and spelling problems."

1-10 copies, per copy. $1.25

Moore Eye-Hand Coordination and Color Matching Test

by Joseph E. Moore
Joseph E. Moore and Associates

"This test measures the speed and accuracy with which an individual can coordinate small muscle movements involving eye-hand activity, since it requires the coordination of the thumb, the index finger, and the eyes in a constantly changing spatial pattern.

The color matching portion of the test measures the speed with which a person can select and match four colors; red, green, blue, and yellow. Besides revealing the individual's speed and accuracy for color selection and placement, this test is helpful in disclosing the presence of color blindness, although not in measuring its exact nature or extent." Some validity and reliability information was given. Norms are available for preschool-adult. (Some tables of normative data were received.)

Test. $25.00

Mosaic Design Set (Large)

Educational Media

"The task challenge demands continue to increase as the student is introduced to the design patterns called for in this 80-piece instructional set. Large design problems are called for in the progressive series of patterns enclosed with this set. The material is accompanied by an instructional sheet describing the step-by-step procedures which will lead the student to eventual success in this exercise, which calls for eye-hand coordination, memory for design, and color and shape recognition and reproduction."

Large mosaic set. $2.50

Mosaic Design Set (Small)

Educational Media

"In this second of the 'Design for Learning' series, the student is introduced to progressive demands of more complicated patterns through the use of a 42-piece wooden mosaic set, attractively produced in varied colors. The total task demand is carefully described in step-by-step procedures for the classroom instructor to follow."

Small mosaic set. $2.25

Motoric Aids to Perceptual Training

by Clara M. Chaney and Newell C. Kephart
Charles E. Merrill Publishing Company

"Offers basic motor and perceptual activities for training children with learning disorders, including the brain injured and retarded.

"Presents theoretical basis for such training in the first section. Deals with learning problems and questions of behavior control.

"Considers problems of evaluation of behavior and includes methods of observation suitable for use by both parents and teachers.

"Provides complete illustrated descriptions of activities and programs for training and teaching the slow learner.

"Contents: Motor-Perceptual Learning. How to Structure and Control Behavior. Procedure for Evaluation. Learning to Listen. Basic Adjustments. Differentiation and Locomotion. Ocular Motor Coordination. Speech Readiness."

1968, 128 pp. $3.95

Motor Aids to Perceptual Training–Observation Checklists

by Clara M. Chaney and Newell C. Kephart
Charles E. Merrill Publishing Company

"Developed for classroom teachers and teachers of special groups. Designed to help the teacher develop a 'clinical eye' for observing behavior in the child's performance on the *Purdue Perceptual-Motor Survey and Visual Achievement Forms* by Roach and Kephart.

"Helps teacher to diagnose and isolate areas of difficulty and to design a suitable training program.

"Contents: Observations of Basic Motor Movements. Differentiation: Head Control, Trunk Differentiation. Balance and Coordinated Differentiation: Changing Positions, Sitting, Standing, Locomotion, Walking and Running, Galloping, Gliding. Observations of Visual Motor Movements. Fixations with Reach, Grasp, and Release: Reaching, Grasping, Releasing, Pursuits."

1968, 16 pp., package of 20. . . . . $3.00

New York School Vision Tester

Bausch and Lomb

"Research has revealed that on the average three out of ten American school children suffer from inadequate vision. That's thirty out of every hundred children handicapped to some extent in their learning ability! Most of these children are unaware of their defective vision and often do not show symptoms of faulty vision.

"To identify these three out of ten children, schools need a test that is easily administered and reliable. It is generally agreed that such a test must consist of more than a Snellen wall chart–that it should use acuity characters of the illiterate type, include a test for farsightedness, and permit measurement of muscle balance where desired.

"The School Vision Tester meets all these requirements. . . . It provides a highly reliable and practical method for measuring the seeing performance of each child. It is a screening device indicating those who are handicapped in their learning ability and who will benefit by a complete professional eye examination." Bibliography included.

Tester, slides, scoring key, manual. $325.00

Oseretsky Motor Proficiency Tests

Maria Irene Leita da Costa, Translator
Edgar A. Doll, Editor
American Guidance Service, Inc.

"The Oseretsky Tests comprise a year by year scale of the fine and gross motor development of children. The test was conceived and executed for measurement of motor skills in the same manner as the Binet Test for Intellectual Skills. Six basic types of tasks are included for each age.

"These tasks require: General static coordination, dynamic coordination of the hands, general dynamic coordination, motor speed, simultaneous voluntary movements, performance without extraneous movements." For ages 4-16.

Set of test equipment, including manual and 25 record blanks. $28.00

A Paddle of Many Uses

by Roy McGlone
LADOCA Project and Publishing
Foundation, Inc.

A wooden paddle on which a variety of cubes can be "flipped." This teaching device was invented by Roy McGlone and was developed at Laradon Hall (School for Exceptional Children, Denver, Colorado) where, through severe tests, it became a most valuable teaching instrument in many avenues of learning.

"It offers a challenge that the child can seldom ignore. It offers an opportunity at the same time to develop a skill and pride that drives him on to other useful accomplishments.

"Its more apparent value is a means of developing hand and eye coordination along with a very deep concentration both of which will become an important and permanent part of the pupil's growth.

"It develops the understanding of color and forms as well as the ability to recognize quick change.

"It can be so arranged as to be the first happy steps in arithmetic, spelling, and reading and yet be in the field of recreation. These steps can be regulated in length with regard to the pupil's progress.

"Word recognition has been made easier by the use of pictures with their printed and written symbols; set up with a scheme for matching." A booklet describing the paddle exercises was received.

Set. $8.75

Parents Home Training Guide Kit

Winter Haven Lions
Research Foundation, Inc.

"The procedures and the methods detailed in this manual can be used by parents to increase a young child's ability and skill to more readily handle the perceptual tasks involving 'contour' and 'outline form.' These procedures can also be used to reinforce the total perceptual process known as the 'visual-tactual-kinesthetic,' or more simply, a child's eye-hand-motor performance.

"A child must learn the three basic parts having to do with 'form-training'–the 'seeing' (or visual) part, the 'tactual' (or feeling) part, and the 'kinesthetic' (or motor) part. Comparable skill is needed in all three parts if a beginning school child is to achieve at or near his maximum potential achievement level.

"Kit contains: 1. Training Manual, 2. Set of Six Form Templates, 3. Sample Scoring Sheets, 4. Construction Directions for Walking Board, Jump Board, Slant Top Desk." Kits available for children in kindergarten (ages 5-6) and in the first grades (ages 6-8).

Kit. $3.00

The Parkinson Program for Special Children

by Herbert Goldstein and Edith Levitt
Follett Educational Corporation

The program consists of a reading readiness kit (for M.A. 3.6 to 4.6) and reading readiness workbooks (for M.A. 4.6 to 5.6) designed to develop visual, spatial, and auditory discrimination as well as concept formation. The program assures the teacher that the prerequisites for academic success are "covered and learned."

Program kit (including materials for 15 pupils). $128.16

Pathway School Program/1: Eye-Hand Coordination Exercises

by G. N. Getman
Teaching Resources

"The Pathway School Program/1 is particularly valuable in assisting children with learning disabilities in acquiring the skills of discrimination and dexterity necessary for eye-hand coordination. The exercises in this program provide a controlled activity sequence in which the child learns to use his eyes and hands in a receiving-responding-performing unity. The program involves the postural and manipulative systems in a goal-directed activity. The exercises increase in difficulty progressively so that even the most adept child will find the program challenging.

"The physical activity involved in these exercises requires the achievement of control in body posture and balance as well as fluidity of movement. The child is taught to cross the mid-line of his body without hesitation or loss of control. He must acquire skills in motor planning in order to accurately judge the amount of body movement and force necessary for each task. At the same time, he must maintain directional control for accuracy. Practice is also given in left and right directionality. Oral commands are used to strengthen the child's grasp of quantitative concepts, directionality, and to reduce perseveration.

"These exercises are not games of strength, but rather of skill and soft-touch control of the direction and rhythm of the ball. When the ball is tapped correctly, the child's eyes, ears, and hands will tell him that he is hitting it well.

Incorrect strokes are so obvious that the child can recognize his own error, stop, and start over–thus reducing the possibility of reinforcing incorrect performance.

"The Pathway Program is designed to help in preparing a child for the more advanced perceptual-motor skills necessary for reading and writing." For kindergarten and primary levels.

Program and guide..... $15.00

Perceptual Testing-Training Kit for First Grade Teachers

Winter Haven Lions
Research Foundation, Inc.

Kit contains test manual, test cards, 100 scoring sheets, perceptual testing and training by Florence E. Sutphin, set of targets for group testing, and various template of geometric forms. The purpose of the training program is to develop perceptual readiness for beginning reading through visual-motor training. Some references were included.

Kit..... $14.00

First Grade Classroom Unit "A" (Regular Master Templates)
Contains above materials in addition to materials for a class of 30.
Unit "A"..... $47.00

First Grade Classroom Unit "B" (Plastic Translucent Master Templates)
Contains above materials in addition to materials for class of 30.
Unit "B"..... $111.50

Perceptual Testing-Training Kit for Kindergarten Teachers

Winter Haven Lions
Research Foundation, Inc.

Kit contains a Perceptual Testing and Training Guide for Kindergarten Teachers, Kindergarten Teacher's Test Manual (Visual-Motor Forms), pads of 100 Training Forms, and various templates of geometric forms. The purpose of the training is to develop perceptual readiness for beginning reading through visual-motor training. Some references were included.

Kit..... $16.00

Kindergarten Classroom Unit "KA" (Regular Master Templates) Contains above materials in addition to materials for class of 15.
Unit "KA"..... $40.50

Kindergarten Classroom Unit "KB" (Plastic Translucent Master Templates) Contains above materials in addition to materials for class of 15.
Unit "KB"..... $85.50

Perceptual Training Activities Handbook

by Betty Van Witsen
Teachers College Press

"This is a handbook of activities, systematically developed, empirically tested, and suitable for use by the teacher of normal or exceptional children. Nearly two hundred separate entries are given, using words and line drawings, and there is a special appendix on paper-folding (origami) with easy-to-follow directions. While major attention is given to basic visual and auditory skills, activities for developing tactile, olfactory, gustatory, and kinesthetic perception are also included."

1967, 96 pp..... $1.75

Perceptual Training in the Curriculum

by George H. Early
Charles E. Merrill Publishing Company

"Demonstrates how teachers can modify certain curriculum activities to combine perceptual and academic learning in the same activity.

"Offers curriculum units of study and projects which provide many illustrations of the theory and principles in action. Encourages teachers to make their own creative modifications.

"Contents: The Problem and an Approach. A Theory of Perceptual Development. From Theory to Remediation. Perceptual Training With Social Studies. Construction Phase. Use Phase. Perceptual Training with the Language Arts. Unit: Beginning Reading With Experience Charts. Perceptual Training in a Science Unit. A Science Unit: 'Force, Energy, and Power.' Perceptual Training in an Industrial Arts Unit. An Industrial Arts Unit: 'Small Gasoline Engines: Disassembly, Assembly Nomenclature, and Functioning.' Bibliography: Appendix: Constructing a Styrofoam Sphere."

1969, 160 pp. . . . . price to be announced.

Pre-Tests of Vision, Hearing, and Motor Coordination

by Elizabeth T. Sullivan, Willis W. Clark,
and Ernest W. Tiegs
California Test Bureau

"These tests are designed to help screen those who may have difficulty in responding to a group test because of defects in vision, hearing, or motor coordination. Special provisions should be made for these individuals before administering a group test." Various forms are available for kindergarten-adult levels. Sample copies of tests, keys, and manuals were received. No references were cited in the manual.

35 tests, manual, and scoring key. . . . . $2.10 (Sold only to qualified purchasers)

A Psychoeducational Inventory of Basic Learning Abilities, With Student Workbook

by Robert E. Valett
Fearon Publishers

"For the initial evaluation of elementary and junior high school students with suspected learning disabilities. Samples educational tasks from the 53 basic learning abilities in the author's *The Remediation of Learning Disabilities. Defines and illustrates each learning ability and gives beginning, intermediate, and* advanced level tasks to test the student's performance."

Specimen. $1.00

A Psychoeducational Profile of Basic Learning Abilities

by Robert E. Valett
Consulting Psychologists Press

"This profile is an 8-page booklet for use by psychologists in conveniently summarizing clinical information and standardized test data in five basic ability areas: motor integration and physical development; perceptual abilities; language; social-personal adaptivity; general intellectual functioning.

"The Profile is not a test in itself but a useful tool for recording data from a variety of widely used tests and tasks. Age range: 2 to 14 years. Booklet contains norms for each item, a scale to profile results, and references to published tests covering the five ability areas. Ideal for communicating the psychologist's findings to parents and teachers."

Examiner's kit (manual and 10 profiles). . . . $3.00

The Purdue Perceptual-Motor Survey

by Eugene Roach and Newell C. Kephart
Charles E. Merrill Publishing Company

"Constitutes the first study to develop normative data on young school children (grades 1 through 4) in regard to perceptual-motor behavior.

"Makes it possible for the classroom teacher to assess perceptual-motor problems in the school setting. Also relates these problems to a remedial program of educational methods and procedures. Designed to be used with *The Slow Learner in the Classroom* by Dr. Kephart as a therapeutic prescription for training. . . .Contents: Rationale and Development. Standardization Statistics. Administration and Scoring. Recording the Perceptual-Motor Ratings."

1966, 100 pp. $4.95

The Rail Walking Test

by Roy Heath
Department of Psychology
Trinity College
Hartford, Connecticut 06106

"The Rail-Walking Test was designed to be a reliable and valid index of locomotor coordination." Ages 6-14, Adult. A summary paper was sent by the author describing materials, procedure, scoring, reliability, and validity. Additional information can be found in *American Journal of Psychology,* 1942, *55,* 240-47; *Psychological Bulletin,* 1943, *40,* 282-84; and *American Journal of Psychology,* 1944, *57,* 482-99.

The Remediation of Learning Disabilities: a Handbook of Psychoeducational Resource Programs

by Robert E. Valett
Fearon Publishers

"Fifty-three specific learning disabilities are operationally defined and grouped into six major areas of learning: Gross motor development, sensory-motor integration, perceptual-motor skills, language development, conceptual skills, and social skills. Each program includes suggested remedial activities, a sample program and four-stage worksheet, and a listing of program references, instructional materials, evaluation and diagnostic aids, and related readings. Forms are provided by which the student may be evaluated in each of the 53 learning abilities and his progress charted as the resource programs are employed."

1968, 228 pp. in loose-leaf binder. $12.00

Robbins Speech Sound Discrimination and Verbal Imagery Type Tests

by Samuel D. Robbins and
Rosa Seymour Robbins
Expression Company, Publishers

"The use of the speech sound discrimination tests and exercises in this booklet will determine just which types of speech sounds a child who manifests a phonetic speech defect of sensory origin is unable to differentiate. It will help the child to see, hear, and feel the difference between the individual sounds which compose these groups.

"The enlarged revision (1958) of this booklet contains the Verbal Imagery Type Test. Much time can be saved in correcting articulatory speech defects if the child's most vivid types of verbal imagery are known in advance. This test and instructions for the Non-Verbal Mental Imagery Type Test, also included, have been used widely in state clinics." A copy of the booklet and sample scoring sheets were received.

Booklet, 43. . . . . $1.50

Scoring sheets for young children (pad of 50). 75

Scoring sheets for older children (8 page booklet). 25

Simple Agility Movements for Impulse Control–Pre-Tumbling Skills

by Dorothy B. Carr
and Bryant J. Cratty
Educational Activities, Inc.

"NEW! This album contains instructions for relaxation training as well as instructions which may aid children to control tensions in specific parts of their body, rather than permitting a spillover of tensions in all body parts when movement in only one part is desired. From these beginnings, the instructions on the record take the children through tasks in which they are encountered to move their limbs and total bodies as slowly as they can. The instructions on the record promote body-image training as well as impulse control training–two important areas in perceptual motor development. It also provides a sound base for more complicated tumbling movements."

2 12" 33-1/3 rpm records. $11.90

The Slow Learner in the Classroom

by Newell C. Kephart
Charles E. Merrill Publishing Company

"Shows how to release the achievement potential of slow-learning children. Highly useful with the *Purdue Perceptual-Motor Survey*.

"Begins by describing some of the major learning areas in the development of the preschool child. Shows how the student lacking in basic readiness skills cannot perform a large number of school tasks and so becomes easily confused.

"Continues by presenting a series of performances which offers definitive clues in identifying the slow-learning child–these performances evaluate the student's status in basic learning areas.

"Concludes by drawing from methods developed by clinical experimentation in teaching pre-readiness skills. Adapts these methods for use in the classroom.

"Enables the teacher to identify the slow learner early and shows how to sharpen his readiness skills.

"Contents: Development and Achievement. Introduction. Skills and Abilities in Simple Tasks. Motor Bases of Achievement. The Perceptual Process. Development of Form Perception. Space Discrimination. A Perceptual Survey Rating Scale. Training Activities. Chalkboard Training. Sensory-Motor Training. Training Ocular Control. Training Form Perception."

1960, 304 p. $6.50

Sound Discrimination Set

Educational Media

"Each set consists of 3 pairs of sound cubes, alternating black and white for ease of matching. These highly functional sound cubes are an integral part of the Media program which is based upon progressive training demands in perceptual discrimination. This unit is useful as an *assessment device* to determine the child's gross ability to differentiate sounds, and as a *training device* to develop attention to sound differences."

Set. $2.75

Southern California Figure-Ground Visual Perception Test

by A. Jean Ayres
Western Psychological Services

"A measure of visual perception dysfunction in children from 4-11 years of age. Uses figure-ground designs of embedded objects and forms. Standardized on 1,164 boys and girls. Takes approximately 20-30 minutes."

Test materials, manual, 25 protocol booklets. $15.00

Southern California Kinesthesia and Tactile Perception Tests

by A. Jean Ayres
Western Psychological Services

"Measures dysfunction in somesthetic perception, without verbal responses, in children from 5-8 years of age. Standardized on 953 boys and girls. Includes subtests of kinesthesia, manual form perception, finger identification, graphesthesia, double tactile stimuli perception, and localization of tactile stimuli. Takes approximately 15-20 minutes."

Test materials, manual, 25 protocol booklets. $22.00

Southern California Motor Accuracy Test

by A. Jean Ayres
Western Psychological Services

"A widely used test to measure the degree of and changes in sensorimotor integration of upper extremities of individuals with nervous system dysfunction. Also assists in making diagnoses of perceptual-motor dysfunction. Norms for children from 4-8 years of age. Takes approximately 10-15 minutes."

Test materials, manual, 25 test booklets. . . . $14.00

Southern California Perceptual-Motor Tests

by A. Jean Ayres
Western Psychological Services

"A just published series of six tests designed to evaluate dimensions of perceptual-motor function in children from 4-8 years of age. The six tests are: Imitation of Postures; Crossing Mid-Line of Body; Bilateral Motor Coordination; Right-Left Discrimination, Standing Balance, Eyes Open; Standing Balance, Eyes Closed. Five of the six tests require no verbal responses and only two items on the sixth test require language. Standardized on over 1,000 boys and girls. Takes approximately 29 minutes for all six tests."

25 protocol sheets manual. $7.50

Steps to Achievement for the Slow Learner

by Marylou Ebersole, Newell C. Kephart,
and James B. Ebersole
Charles E. Merrill Publishing Company

"Provides both theory and curriculum material for teaching the child with brain damage or learning disability.

"Discusses special needs and possible behavioral characteristics of the child handicapped by brain-dysfunction in the first two chapters. Defines brain damage in terms of the nervous system in Chapter 3, carefully pointing out why no two brain-injured children are ever alike. Relates these neural aspects to learning theories in Chapter 4. Also relates the learning theories to the importance of the sensory techniques used for teaching the child.

"Discusses developmental stages of learning in Chapter 5, disclosing why motor learning is basic to perceptual and then to conceptual learning. Relates motor patterns to the child's need for exploration. Relates exploration to the child's evaluation of space and time.

"Emphasizes the child's need for a stable point of reference—himself—in Chapter 6. Lists arm and hand activities to help the child to better know and coordinate his extremities in Chapter 7.

"Presents pre-reading, pre-writing, and pre-arithmetic activities in a step-by-step manner in conconcluding chapters."

1968, 224 pp. $4.95

The 'Stycar' Hearing Tests (Revised Edition, 1968)

National Foundation for Educational
Research in England and Wales

"These tests, designed to obtain reliable information concerning a child's capacity to hear with comprehension in commonplace situations, consists of a series of simple clinical auditory screening tests, which, it has been found, are useful in the preliminary assessment of the everyday hearing of very young or mentally handicapped children. In the current 1968 edition of the test, many of the fragile toys have been replaced by more durable models. There has been a complete revision of the manual and the format has been improved. Photographs of babies and young children responding to the tests have been included and the pictures for use in the spoken vocabulary tests have been redrawn and printed in full color. Also, the surfaces of all printed cards have been laminated with a cellulose acetate film to facilitate cleansing."

Complete set. . . . . approximately $13.80 (To obtain this test, a "Qualification Form for Tests" must be filled out. Must have had specific training in the use and application of the test.)

The 'Stycar' Vision Tests (Revised Edition, 1968)

National Foundation for Educational Research in England and Wales

"These tests, consisting of a series of simple clinical tests employing selected Snellen letters and a set of miniature toys, were designed to give reliable information concerning the distant and near vision of young normal children between 2 and 7 years and handicapped children of a corresponding range of mental ability. The current 1968 edition of the test includes the replacement of many of the original fragile toys by more durable models. Also, in accordance with international standards, the printed material (including all single letter tests, key cards and charts), have been carefully revised and additional smaller letters provided. A second letter chart has been added to provide an alternative distance test. Finally, the surfaces of all cards and charts have been laminated with a cellulose acetate film to facilitate cleansing."

Complete set. . . .approximately $14.40 (To obtain this test, a "Qualification Form for Tests" must be filled out. Must have had specific training in the use and application of the test.)

Tactile Discrimination Set

Educational Media

"In this training aid, the student manipulates four pairs of varied types of fabrics and four pairs of varied objects for matching purposes. In addition, to increase the task challenge demands, a blindfold is included for use in developing a fine degree of tactile discrimination. Useful to determine the child's abilities to differentiate objects both visually and tactually."

Set. $2.75

Titmus Vision Testers

Titmus Optical Company, Inc.

"The Titmus Vision Tester provides methods by which a competent technician can obtain precise and usable information on basic visual functions with the use of minimum floor space, plus savings in time and effort. The General Testing Model incorporates test slides which are usable for a variety of specific purposes.

"The Titmus Vision Tester (General Testing Model) provides an excellent method for vision screening programs where a spread of age groups exists. . . . Specific tests for each purpose are available at a turn of the dial. Predetermined standards of pass or fail are set at the local level by those who have the responsibility of referrals and corrections of anomalies." (Information on other vision tester models was also received.)

"The Titmus Vision Testers, listed as various models such as General Testing, Pediatric, etc., are identical instruments. The model is determined by the slides placed within the instrument and the accessories which accompany it.

"If your work deals with preschool, underprivileged or retarded children as well as others, we suggest that you consider the General Testing Unit as a desirable combination.

"Tests provided for use in our Titmus Vision Tester are valid and reliable. . ."

From a letter from R. A. Sherman, Manager, Division of Applied Sciences.

General testing unit, manual control, with slides and accessories for preschool, elementary, and older levels. $426.15

Try: Experiences for Young Children

by George Manolakes, Robert Weltman, Marie Jepson Scian, and Louise E. Waldo

Noble and Noble, Publishers, Inc.

"Try is a program of sequential experiences–learning experiences–that encourage the child to inquire, to explore, to better understand and relate to the world around him."

The program develops visual-motor skills and oral language, and provides individualized activities and an organized sequence of experiences.

"As the child moves progressively from simple to more complex levels within each task and from task to task, certain elements remain common to the entire program. Through these, the child is able to progress with increasing independence, leaving the teacher free to work with individual children as they need her. All Visual-Perceptual Experiences encourage the development of left-to-right and top-to-bottom orientation. All Visual-Perceptual Experiences use a matching-to-sample technique which meaningfully reinforces the child's visual perception through familiar hand movements. All Related Expressive Experiences provide simple picture cues which enable the child to proceed independently of teacher direction. All Visual-Perceptual Experiences are coded so that the teacher will know immediately whether it is a new experience, a reinforcement page, or a critical checkpoint." Recommended for children ages 4-7.

Kit, including all manipulative materials (one kit is recommended for every five pupils). $20.00

Valett Developmental Survey of Basic Learning Abilities
by Robert E. Valett
Consulting Psychologists Press

"The Valett Survey is designed for use by teachers, educational therapists, pediatricians, remedial tutors, or school psychologists to evaluate the developmental status of children between the ages of 2 and 7. The Survey contains 233 easily-administered tasks covering seven areas: Motor Integration and Physical Development, Tactile Discrimination, Auditory Discrimination, Language Discrimination, Language Development and Verbal Fluency, Conceptual Development.

"It is not necessary to administer all 233 items—the user may select those most appropriate to the child's developmental level. Results may be used to determine whether referral for a complete diagnostic evaluation is indicated and to plan a tentative educational program for the child."

Specimen set (manual, workbook, and scoring booklet). $1.99

Varied Shapes and Forms Set
Educational Media

"A sequential training program is established through the introduction of varied shapes and forms. In this training aid, 51 wooden objects (red, blue, green, yellow, and black) allow the student to develop hand-eye discrimination and coordination as he is called upon to respond to the details of design reproduction, as described in the teacher guide which is enclosed with the unit."

Set. $2.25

Visual Experiences for Creative Growth
by Millard H. Black, Elsie Benson Black, Newton S. Metfessel, and Earl Theisen
Charles E. Merrill Publishing Company

"Before a child can understand and apply the abstract concepts involved in reading, writing, and counting, he must have developed certain motor-perceptual skills, grasped spatial and temporal relationships, learned to make accurate auditory and visual discriminations, and achieved a degree of oral language competency.

"These study prints help pupils develop those skills which research has found to be directly related to success in reading and general school achievement. . . .

"The series consists of sixty study prints and lesson plans (six units of ten photographs and lessons plus an introduction for each unit).

"The lessons in Units I and II are related to the development of motor-perceptual skills, a prerequisite of effective learning. Social-emotional concepts which are the bases for the contents of Units III and IV are also related to the effectiveness with which young children learn. The concepts and language skills developed through the materials in Units V and VI will help the pupil to understand, communicate, and participate all through school."

Complete set of all six units. $70.00

Visual Perception Filmstrips
by Sidney Groffman
Classroom Materials Company

A structure visual training program with filmstrips dealing with Visual Discrimination and Spatial Orientation, Visual Matching, Visual Constancy, Visual Motor (Form) Coordination, Visual Memory, Figure-Ground, and Visualization. A copy of the *Manual of Instructions for Classroom Use* was received. The manual includes general instructions, techniques of response, teaching guides, scripts, and answer sheets for each filmstrip. No prices given. (A letter from Customer Service describing ordering procedures was received.)

Visual Perception Skills—Primary
Educational Activities, Inc.

"Visual perception has been shown to be the single most important factor in promoting reading achievement. This series is designed to aid in the development of basic visual skills. While structured exercises dealing with several aspects are presented in each filmstrip, one particular area of visual development is stressed in each. Visual memory, visual motor coordination, visual constancy, visual discrimination, visualization, figure-ground perception, visual matching."

7 color filmstrips. $49.00

Weight Discrimination Set
Educational Media

"In this Media set, the student is introduced to differences in weight through the use of three pairs of plastic containers containing different weight capacities. The weight cubes are 3 each of black and white to allow for self-operating and self-correcting. Useful as an *assessment device* to determine basic kinesthetic awareness, and as a *training device* to develop attention to details of difference."

Set. $2.75

ADDRESS LIST

Allied Education Council
Distribution Center
Box 78
Galien, Mich. 49113

Ambco Electronics
1222 W. Washington Blvd.
Los Angeles, Calif. 90007

American Guidance Service, Inc.
Publishers Building
Circle Pines, Minn. 55014

Ann Arbor Publishers
Campus Village Arcade
611 Church St.
Ann Arbor, Mich. 48104

Bausch and Lomb
Rochester, N. Y. 14602

California Test Bureau
2702 Monroe St.
Madison, Wisc. 53711

Classroom Materials Company
93 Myrtle Dr.
Great Neck, N. Y.

Consulting Psychologists Press
577 College Ave.
Palo Alto, Calif. 94306

Education Activities, Inc.
P. O. Box 392
Freeport, N. Y. 11520

Educational Media
Remediation Associates, Inc.
Box 2067
Van Nuys, Calif. 91404

Expression Company, Publishers
P. O. Box 11
Magnolia, Mass. 01930

Fearon Publishers
2165 Park Blvd.
Palo Alto, Calif. 94306

Follett Educational Corporation
P. O. Box 5705
Chicago, Ill. 60680

Follett Publishing Company
1010 W. Washington Blvd.
Chicago, Ill. 60607

Holt, Rinehart and Winston, Inc.
Box 3323
Grand Central Station
New York, N. Y. 10017

LADOCA Project and Publishing
Foundation, Inc.
E. 51st Ave. & Lincoln St.
Denver, Colo. 80216

Language Research Associates
300 N. State St.
Chicago, Ill. 60610

Marietta Apparatus Company
118 Maple St.
Marietta, Ohio 45750

Massachusetts Department of Public Health
Division of Maternal and Child Health Services
88 Broad St.
Boston, Mass. 02110

McGraw-Hill Book Company–Western Division
Manchester Rd.
Manchester, Mo. 63011

Charles E. Merrill Publishing Company
1300 Alum Creek Dr.
Columbus, Ohio 43216

Joseph E. Moore and Associates
4406 Jett Rd., N.W.
Atlanta, Georgia 30327

National Foundation for Educational Research
in England and Wales
The Mere, Upton Park
Slough, Bucks, England

The Psychological Corporation
304 E. 45th St.
New York, N. Y. 10017

Psychological Test Specialists
Box 1441
Missoula, Mont. 59801

Science Research Associates, Inc.
259 E. Erie St.
Chicago, Ill. 60611

Teaching Resources
100 Boylston St.
Boston, Mass. 02116

Warren Schloat Productions, Inc.
Pleasantville, N. Y. 10570

Welch Allyn, Inc.
Skaneateles Falls, N. Y. 13153

Western Psychological Services
Division of Manson Western Corporation
12031 Wilshire Blvd.
Los Angeles, Calif. 90025

Winter Haven Lions Research Foundation, Inc.
P. O. Box 111
Winter Haven, Fla. 33880

PERCEPTUAL-MOTOR TASK FORCE
SUMMARY OF
PERCEPTUAL-MOTOR SURVEY

Lee W. Haslinger
Member, Perceptual-Motor Task Force
Pontiac, Michigan 48058

Introduction

Following the Perceptual-Motor Symposium in Washington, D.C. in May 1968, a survey was sent to the 60 participants. Two of the purposes of the survey were: (a) Identification and definition of terminology used and (b) Nature of perceptual-motor abilities. The responses of 24 persons to three pertinent questions of the survey are reported below.

Responses to the survey indicate that the phrase *perceptual-motor* is preferred to such terms as sensorimotor or motor-perceptual. Also, defining perceptual-motor appears to be a difficult task. The meaning comes from the way each person uses it in his own context and in terms of his training and experience. Many de-

RESPONDENT	NUMBER	DO YOU USE THE TERM PERCEPTUAL-MOTOR?		IF NOT, LIST TERM USED.
		Yes	No	
PHYSICAL EDUCATOR				
College	9	9		
City/College Director or Supervisor	4	2	2	Sensorimotor Developmental Physical Education
Elementary Physical Education Teacher	4	4		
OTHER DISCIPLINE				
Ophthalmologist	1		1	Sensory-Motor
Pediatrician	1	1		
Principal (Elementary)	1	1		
Occupational Therapist	1	1		Uses but prefers sensory motor
Social Worker (Specialist)	1	1		
Director of Secondary Education (American International College)	1	1		

fine the term simply as a relationship between perception and motor. Others emphasize the sequence of events including sensory input, interpretation, and action or motor responses. Most of the respondents stress the importance of the integration of the sensory, perceptual, and motor functions of the body.

The range of abilities ascribed to perceptual-motor development could easily lead one to believe that perceptual-motor abilities represent all the factors which affect movement. The list from physical educators and representatives of other disciplines includes both physical abilities and psychological factors. Perhaps it is possible to differentiate between ability or lack of ability with terms more descriptive and diagnostic than "coordinated" and "backward."

Elementary Physical Education Teacher

Q. Define *perceptual-motor* with reference to your own activities and in the context of the way you use the term.

- Perceptual-motor refers to how, what, and why the child learns through movement from the environment and things around it. How the child learns to use his body in relation to the world around him.

- Perceptual-motor activities are those which involve focus on sensory inputs, including kinesthetic and proprioceptive as well as tactile, auditory, and visual and necessarily involves the motor response as the visual proof of the input as the extent of and control over the response indicates the ability to match and produce concepts and cognition of the directed motor tasks.

- Perceptual – all sensory or input information
  Motor – all muscular or output events
  The area cannot be separated. One area affects the other – they are integrated and this results in the final happening.

- Perceptual-motor is a phase of the development of the human which occurs concurrent with sensory motor development (birth-2 years) and continues until about age 4.

City/County Director or Supervisor

Q. Define *perceptual-motor* with reference to your own activities and in the context of the way you use the term.

- "Sensorimotor" – stimulation of the sense organs in conjunction with training body coordination, thereby leading toward greater perceptual acuity.

- The process of the body receiving information from the environment, processing the information according to genetic endowment and environmental influences, both past and present, then coordinating the information to direct meaningful movement responses.

- "*Developmental Physical Education*" – used to describe the relationship between perception and motor responses.

College

Q. Define *perceptual-motor* with reference to your own activities and in the context of the way you use the term.

- The relation of physical activities to the development of the intellect. A motoric base to perception – related to cognition.

- Implies that a sequence of events, including sensory stimulation, critical processing of information, and overt behavior must have taken place.

- The integration of the functions of the body that have a voluntary motor component and the sensory feedback and sensory perception that develops during this performance. It should also include the maturation and growth of the individual. Along with this, is the learning process in the acquisition of motor skills or tasks. Every motor act must rely on perceptions from past learning in order to integrate and adapt to new behavior tasks. All motor tasks have some generalities although they are specific for themselves. Must operate in the elements of space-time-force where a flow of movement is the task.

- The ability of the child to perceive the world around him and to know where his body is and what it is doing. To integrate and match the information his senses provide to control his body so that it may correctly respond.

- Influence of sensory cues and perceptual processes on motor activity.

- Perceptual-motor refers to an emphasis on responses where interpretation of sensory stimuli is necessary, as opposed to those re

(Text continued on page 164.)

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION AND RECREATION
PERCEPTUAL-MOTOR SURVEY

Perceptual-Motor Task Force

Q. List special abilities which are identified with perceptual-motor development (or other term).

PHYSICAL EDUCATORS			DISCIPLINES OTHER THAN PHYSICAL EDUCATION				
Elementary Physical Education Teacher	City/County Director and Supervisor	College Physical Educator	Director of Secondary Education (College)	Pediatrician	Elementary School Principal	Occupational Therapist	Social Worker
Body Image 2 Balance 3 Form Perception 1 Differentiation 1 Spatial Awareness 1 Body Spatial Organization 1 Rhythm 3 Position in Space 1 Directionality 2 Laterality 2 Specific Movements 1	Body-Hand Image 4 Balance 2 Locomotion 2 Agility 2 Finger-Hand-Eye Integration 1 Strength 2 Endurance 2 Form Perception 2 Movement Perception 1 Position in Space 2 Hearing Discrimination 1 Space Direction 1 Spatial Awareness 1 Flexibility 1 Nonlocomotor	Body Image 1 Balance 3 Gross Motor Skills 1 Fine Motor Skills 1 Spatial Discrimination 1 Temporal Discrimination 1 Form Discrimination Form Consistency 1 Figure Ground 1 Spatial Relation 1 Spatial Orientation 2 Body Awareness 2 Directionality 3 Laterality 3 Coordination 1 Size 1 Flexibility 1 Depth 1	Body Image 1 Visualization 1 Motor Planning 1 Oculomotor Control 1	Body Image 1 Balance 1 Gross & Fine Dexterity 1 Optokinetic 1 Nystagmus 1 Coordination 1 Position in Space 1 Laterality 1	Dominance 1 Spatial Relationship 1 Position in Space 1 Laterality 1	Body Image 1 Postural Balance 1 Bilateral Integration 1 Motor Planning Ability 1 Visual Perception including: Directionality Figure-Ground Visualization Recognition of form space perception	Balance 1 Body Image 1 Optic Convergence 1 Figure-Ground Discrimination 1 Position in Space 1 Visual-Motor Coordination 1

Enviromental Awareness 1 Body Awareness 2 Focus 1 To Match 1 Acceptance of Decision Making 1 Awareness of Self 1 Gross Motor Control 1 Fine Motor Control 1 Eye Motor 1 Creative Motor Skills 1 Eye-Hand 1 Eye-Foot 1 Upper and Lower Coordination 1	Movements 1 Figure-Ground 1 Basic Body Movements 1 Eye-Hand Co-ordination 1 Eye-Foot Co-ordination 1	Strength 1 Visual Perception of objects & events 1 Eye-Motor Co-ordination 1 Detection of Stimulus 1 Comparison of Stimulus 1 Recognition of Stimulus 1 Pattern Recognition 1 Selective Attention 1 Direction Awareness 1 Memory Processes 1 Visual Interpretation 1 Accuracy, Frequency, & Timing of Movements 1 Basic Body Movements 1 Eye-Hand Co-ordination 1 Eye-Foot Co-ordination 1		Figure-Ground 1	Figure-Ground 1		

sponses where little stress is placed on the perceptual mechanism. Perceptual-motor refers to responses to real objects in the spatial world as opposed to the manipulation of symbols and signs.

- The interrelationship and integration of sensorimotor experiences and perceptual development.

- Adjective as in "perceptual-motor performance" relating to the muscular activity resulting from the individuals past and present *inter-*sensory experience.

Other Disciplines

Q. Define *perceptual-motor* with reference to your own activities and in the context of the way you use the term.

Pediatrician – I use the term to refer to children with intact sensory end-organs, with little or no emotional disturbance, and with normal intellect who have difficulties in receiving and interpreting input from various senses.

Elementary School Principal – Perceptual-motor is the input and output functions of the organism. The motor ability is a complex coordinated sequence of patterns to accomplish a purpose.

Occupational Therapist – sensory motor defined as the input received by the central nervous system as a result of sensory stimulation feedback from the proprioreceptor in response to gravity and/or performing a task.

Social Worker-Specialist – visual input and an action stemming from that visual perception.

College Director of Secondary Education – Perceptual-motor refers to the cycle of receptor-stimulation-encoding and feeding out appropriate motor response. It is virtually impossible to assess at what point the perceptual cycle becomes motor so that perceptual-motor becomes a rather general term.

SOME PROGRAMS OF
PERCEPTUAL-MOTOR DEVELOPMENT

Lee W. Haslinger
Member, Perceptual-Motor Task Force
Pontiac, Michigan 48058

The programs summarized below include some which were submitted for consideration as "action programs" for the National Multidisciplinary Perceptual-Motor Conference held in Cincinnati, Ohio, October 1-3, 1970. The list is not intended to be all inclusive of the many outstanding efforts being carried out throughout the country in the area of perceptual-motor development. Other schools and colleges or universities which are conducting programs are invited to send material describing the rationale, organization, program, activities, assessment instruments, and results to date to Lee W. Haslinger, Perceptual-Motor Task Force, 350 E. Wide Track Dr., Pontiac, Mich. 48058.

Sensorimotor Skills Program

Bill Braley
Special Services Consultant
Early Childhood Education Program
1302 Cory Dr.
Dayton, Ohio 45406

An ESEA, Title I Grant funded a longitudinal study of the effects of sensorimotor training in 22 preschool centers and 22 kindergartens in a target area of economically disadvantaged. The funding provided for sensorimotor specialists and aides to administer sensorimotor tests and assist classroom teachers in planning and carrying out daily activities of gross and fine motor activities.

Project Genesis

Dorothy Jens
School Psychologist
Lakeview Public Schools, ESEA, Title III
25907 Jefferson Ave.
St. Clair Shores, Mich. 48081

Program of evaluation of prekindergarten children for potential learning problems and to provide a program for these children on an individualized basis under the supervision of a Master Teacher (Child-er). Effort was also made to educate parents in child growth and development and to aid teachers in providing quality instruction. A screening of 166 preschool children revealed approximately 20 percent who had perceptual-motor disabilities. The screening team consisted of a social worker, perceptual-motor specialist, speech therapist, school nurse, and psychologist.

Differential Education Project

ESEA, Title III
Lamphere Public Schools
235 E. 13 Mile Rd.
Madison Heights, Mich. 48071

This project is geared to teacher education, differential education for children, and parent education. It involves placing all kindergarten and first grade children in classes developmentally according to findings from a battery of screening instruments. The physical educator is an important member of the multidisciplinary team. His task is to carry on the gross motor perceptual aspect of the program, strengthening gross motor skills for all children and the initiating special activities programs for children with severe problems. The perceptual development specialist implements diagnostic screening, promotes multidisciplinary cooperation, and plans programs for the child's educational needs. A program for parents of preschool children is conducted monthly and stresses child development, objectives of the project, and roles of various specialists and teachers.

Kindergarten – Where the Action Is

Alice Van der Meulen
Weedsport Central School District
Weedsport, N. Y. 13166

A reading teacher in Weedsport, New York has initiated an action-oriented kindergarten curriculum designed to help children develop an awareness of themselves and their relationship with the world around them as prerequisite to efficient learning. The "action program" approach is a multifaceted program of pleasurable learning experiences in a sequential progression leading from body knowledge to body control; space awareness to spatial understanding; audial recognition to vocal reproduction; and perception of shapes to recognition of symbols to cognitive proficiency.

Movement and Movement Patterns of Early Childhood

Caroline Sinclair, Ph.D.
Box 452
Gloucester, Va. 23601

Dr. Caroline Sinclair, retired research consultant, has conducted a study to discover and document the developing movement and movement patterns of children, ages 2 to 6. Dr. Sinclair states that the findings of her study should be utilized in developing curriculum for preschool children and that physical educators should extend their programs to provide for preschool children.

Kindergarten Perceptual-Motor Training Curriculum

Lovell McCulloch
Supervisor of Physical Education
Ripon Public Schools
Ripon, Wisc. 54971

A multidisciplinary team of teachers and specialist, including a physical educator, developed a "physiologic" approach to curriculum. This approach stressed perceptual-motor learning as basic to academic achievement. Measures of the effectiveness of this approach included the Frostig Perceptual-Motor Test and the Metropolitan and McGintie Achievement Tests. To date, the experimental groups have excelled when compared with the control groups.

Multidisciplinary Approach to the Development of Verbal and Reading Skills

Mary R. Leonard
Division of Physical Education
Baltimore City Schools
Oliver and Eden Sts.
Baltimore, Md. 21213

or

Eva Weisman
Supervisor, School Social Workers
Baltimore City Schools
Calvert and 23rd Sts.
Baltimore, Md. 21218

A physical educator and social worker are interested in evaluating the contribution that a closely coordinated physical education and school social work program can make in improving the verbal and reading skills of fringe-city and inner-city pupils of low socioeconomic level. A significant finding from the promising results of this study was that multidisciplinary interaction results in a quality of assistance to pupils far greater than the sum of the contribution of the individual disciplines.

Perceptual Motor Program for Children with Learning Disabilities

Program for Perceptual Development
1411 Main St.
Holden, Mass. 10520

This school district has a perceptual-motor program developed by an occupational therapist. It utilizes trained teacher aides to identify children with learning disabilities of a perceptual-motor nature and to provide proper training to help them overcome their problem. Following a period of in-service education, classroom teachers identified children with symptoms common to learning disability children. These children were screened using a variety of instruments and appropriate individualized programs prescribed for each child.

Physical Education for the Intellectually Handicapped

Louis Bowers, Ph.D.
Department of Physical Education
University of South Florida
Tampa, Fla.

An undergraduate and master's degree program of preparation of teachers of physical education for children with motoric and intellectual handicaps. The program includes teaching and evaluation experiences with children in public schools ranging in age from 6 to 16 years. The production of a program of motor development activities illustrated in written and film form has resulted from this endeavor.

Motor-Perceptual Activities for Kindergarten and Primary Grades

Jack Capon
Supervisor of Physical Education
400 Grand St.
Alameda, Calif.

A film and outline of motor-perceptual activities has been developed to assist preschool and kindergarten teachers gain an understanding of motor development as it relates to helping children reach their full potential in the school environment. Material has been developed to provide guidance for teachers in a variety of activities along with suggestions of creative ways to use unique equipment and supplies.

Perceptual-Motor Program in Action

Mildred Chapman
Supervisor of Instruction
Hamilton County Schools
Chattanooga, Tenn.

A program of perceptual-motor activities was implemented to help bridge the readiness gap for 28 third grade children who were reading two years below grade placement. The children received program activities devoted to developing gross motor skills, fine motor skills, language development, and visual perception in addition to formalized reading instruction. Promising results were reported after the first and second years of the project.

Body Management – Elementary Physical Education

Virginia Wood
Consultant,
Elementary Physical Education
Center for Educational Programming
578 E. Market St.
Xenia, Ohio 45385

The Xenia body management program was designed to develop the motor and perceptual skills of all children in grades K-1 and to diagnose those skills that have been arrested in some children. The system-wide consultant for sensory-motor development provides (1) general perceptual-motor screening for grades K-1, (2) referral screening and remedial programming for students in grades K-6, and (3) inservice training for teachers in grades K-6. Classroom teachers are provided with a suggested monthly progression of activities for the year and activities are incorporated into the everyday classroom schedule.

An Approach to the Detection and Remediation of Learning Disabilites in Early Childhood

Ruby Huebner
Director of Special Services
School District 66
Westside Community Schools
Cass at 78th
Omaha, Nebr. 68114

A program designed to measure the value of early diagnosis and intervention with prescriptive teaching for kindergartners and first graders with suspected learning disabilities. Students selected by teachers were administered a battery of diagnostic and performance tests. A special six week summer program was conducted embodying a multi-modality approach wherein each modality area was perceptually oriented. The areas included reading, physical education, music, language development, auditory discrimination, mathematics, spatial relationships, and writing.

Motor-Perceptual Movement Patterns

Dorothy Krause
Borghild Olson
Jefferson School
LaCrosse, Wisc. 54601

The motor-perceptual movement program was designed to benefit all children in grades K-6. The program involves screening by a school psychologist and physical education teacher and a program of activities taught by a motor-perceptual teacher, a classroom teacher, and parents. A booklet has been developed entitled *Motor-Perceptual Movement Patterns – A Program for Establishing Neurological Organization.*

Perceptual-Motor Skills and Reading Readiness of Kindergarten Children

Paul Smith
Coordinator of Physical Education,
Health, and Athletics
Shoreline Public Schools
Seattle, Wash.

Twelve kindergarten classes from six schools with similar socioeconomic backgrounds were selected to participate in a project to determine to what extent children entering kindergarten are ready for first grade reading experiences. There was also an attempt to compare the effects of three methods of presenting perceptual-motor skills on the reading readiness of randomly placed kindergarten children. The activities and movement patterns used in this project were selected to test whether concentration on bilateral movement patterns for 25 weeks during kindergarten will improve the readiness of children.

A Developmental Approach to Perceptual-Motor Experiences for Pre-Schoolers

Marguerite Clifton
Head, Department of Physical Education
for Women
Purdue University
West Lafayette, Ind.

A movement education program for boys and girls two to five years of age currently is in its third year under the direction of the Department of Physical Education for Women at Purdue University. Approximately 60 children participate in each 10-week program, which includes two sessions each week. In each two-hour session the child participates in specifically designed gross motor experiences in an aquatic and gymnasium type setting.

It is the aim of the program to enhance the child's movement through the provision of systematic stimulation of senses critical to perceptual-motor functioning in a gross movement setting. The experiences planned for each child emphasize developmental pacing, and special attention is given to maximizing sensory input in most of the gross motor tasks. Several pilot studies have been and are being conducted in order to prepare a satisfactory longitudinal research design.

APPENDIX

LIST OF PARTICIPANTS

PARTICIPANTS

Officers of AAHPER

Laura Mae Brown, President of AAHPER, Director of Elementary School Physical Education, 16 Selma Ave., St. Louis, Mo. 63119

Barbara Kerch, Vice-President of AAHPER, Physical Education, Community Unit School, District #9, Granite City, Ill. 62040

Task Force

Jack Capon, Supervisor of Physical Education, Alameda Unified School District, 400 Grand St., Alameda, Calif. 94501

Marguerite Clifton, Department of Physical Education for Women, Purdue University, Lafayette, Ind. 47907

Marge R. Hanson, Elementary Education Consultant, AAHPER, 1201 16th St., N.W., Washington, D.C. 20036

Lee W. Haslinger, Director of Physical Education, Athletics and Recreation, Pontiac Public Schools, 350 E. Wide Track Dr., Pontiac, Mich. 48058

Alma Ward Jones, School Psychologist, Dayton Public Schools, 348 W. First St., Dayton, Ohio 45402

Muriel Sloan, Physical Educator, Lathrop Hall, University of Wisconsin, 1050 University Ave., Madison, 53706

Conference Consultant

Darrell Boyd Harmon, Conference Consultant, 4214 Wilshire Pkwy., Austin, Texas 78722

General Session Speakers

Marianne Frostig, The Marianne Frostig Center for Educational Therapy, 5981 Venice Blvd., Los Angeles, Calif. 90034

G. N. Getman, 544 Richard Rd., Wayne, Pa. 19087

Madeline Hunter, Principal, University Elementary School, University of California, Los Angeles 90000

Lovell McCullough, Supervisor of Elementary Physical Education, Ripon Public Schools, Ripon, Wisc. 54971

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